Breidert Air-X-Hauster

THE GREATEST SCIENTIFIC IMPROVEMENT IN ROOF VENTILATORS IN MORE THAN 50 YEARS

PATENT NO. 2269428

PARENT AND KIRKBRIDE

HEATING
VENTILATING
AIR CONDITIONING
EQUIPMENT

FOURTH ST. AT LOCUST
PHILADELPHIA, PA.

Specifications

ENGINEERING DATA

No. 44-1

G. C. BREIDERT CO.

634 SO. SPRING ST., LOS ANGELES 14, CALIF.

AIA File No. 30D1

BREIDERT AIR-X-HAUSTER

AIA File No. 30D1

George C. Breidert, inventor and manufacturer of the Breidert Air-X-Hauster

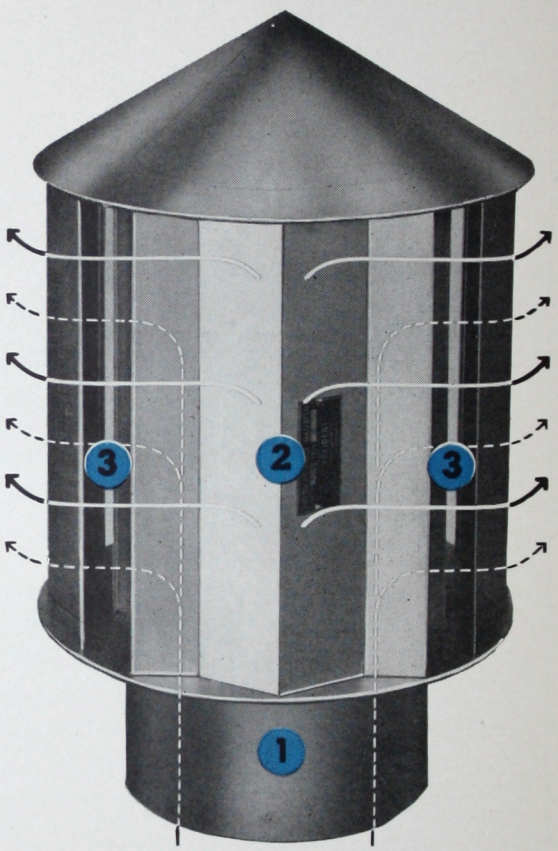
IN THE FEW YEARS that have elapsed since the Breidert Air-X-Hauster was first put on the market, its revolutionary design and remarkable success have led many ventilating experts and builders to ask "Who is Breidert?"

George C. Breidert is a successful ventilating engineer and inventor who has had more than 35 years of practical experience in the ventilating field. He invented the ventilators used extensively on railway cars before the advent of air conditioning. Many of his revolutionary ideas on ventilation are now accepted as standard by the entire industry. He has patented various types of ventilators, many of which are in use all over the world.

It was Mr. Breidert's greatest ambition to design a roof ventilator with greater all-around efficiency and more pleasing architectural lines than conventional ventilators possess. Utilizing proven principles of aerodynamics, Mr. Breidert perfected the radically different Breidert Air-X-Hauster, his most important invention. *It is the greatest scientific improvement in roof ventilators in more than fifty years.* Complete facts about the Breidert Air-X-Hauster and its various types are given on the following pages.

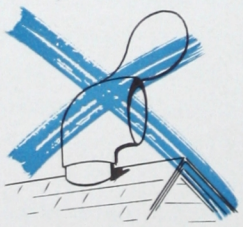
The Greatest Scientific Improvement in Ventilators in more than Fifty Years!

Principle of Operation. The design of the Breidert Air-X-Hauster is completely unlike that of any other ventilator now on the market. Most conventional ventilators work effectively only when the wind strikes on a horizontal plane. Wind currents coming from other angles, which is often the case, cause annoying down-drafts and stagnation of stale air in the ventilator. The design of the Breidert Air-X-Hauster, however, is based on modern science's knowledge of aerodynamics. This revolutionary ventilator utilizes outside air currents to achieve *positive ventilation under all conditions.*



Uses One of Nature's Laws. Air always rushes in to fill a vacuum. Wind currents striking the Breidert Air-X-Hauster create a vacuum, which causes stale air to be sucked out as in the demonstration illustrated at right.

Stationary . . . No Moving Parts. The Breidert Air-X-Hauster remains absolutely stationary . . . requires no fans in ordinary cases. There are no moving parts to jam or get out of order, yet it attains standards of ventilating efficiency never approached by conventional ventilators.



No More Back-Drafts. Due to an ingenious inner baffle construction, it is impossible for the positive suction action of the Breidert Air-X-Hauster to be reversed. *Back-drafts are eliminated where no negative pressure prevails.* The Breidert Air-X-Hauster overcomes many back-draft difficulties where other ventilators fail.

1. Ventilator neck, connected by collar to ventilating pipe.

2. Outside walls of ventilator. V-shaped faces deflect wind (solid white lines) past openings, 3, creating siphon which exhausts stale air (dotted lines).

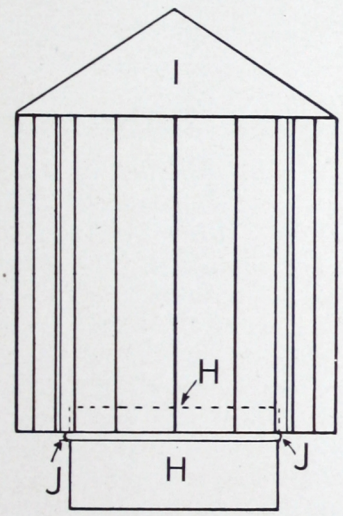
3. Air outlet openings at four corners of the ventilator. Note in drawings on opposite page the ingenious baffle arrangement inside the openings, which prevents back-drafts.

THE BREIDERT AIR-X-HAUSTER

No Matter Which Way The Wind Blows . . .

The aerodynamically correct principle of the Breidert Air-X-Hauster causes it to operate effectively, under either of the conditions shown at right.

In either case, air is siphoned out of the building or vehicle on which the ventilator is installed. The Breidert Air-X-Hauster is adaptable to all types of structures, including many on which roof ventilators were never before considered practical. See applications on following pages.



Key to Letters Shown in Diagrams

(A)—V-shaped wind dividing face on four sides.

(B)—Transverse flat wind-resisting face.

(C)—Vertical openings on four corners where strong siphon is created, drawing air up through neck **(H)**.

(D)—Inside vertical openings through which air is siphoned from neck **(H)**.

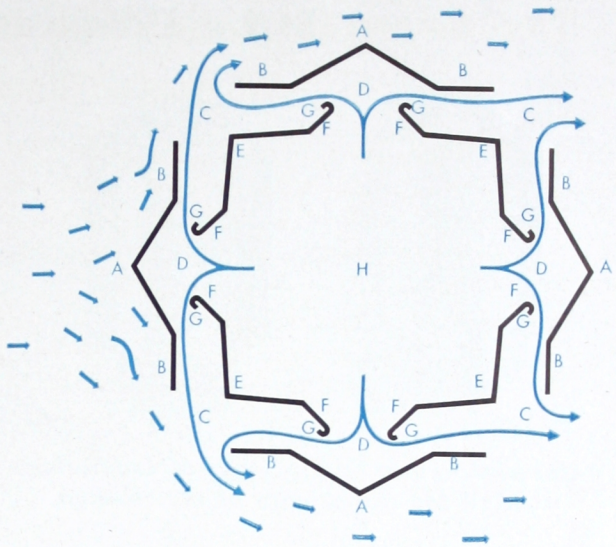
(E)—Inside deflector walls.

(F)—Inside deflectors and rain stops prevent rain from entering through openings **(D)**.

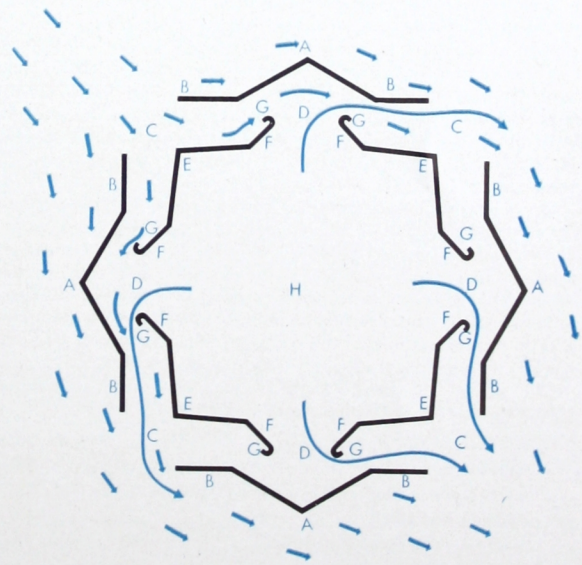
(G)—Rain arrestors.

(H)—Round neck connected with inside of room or building through which air rises. Neck extends above floor or bottom of ventilator. Rain drains outside of neck at **(J)**.

(I)—Cone on top of ventilator deflects down currents of air over openings **(C)**.

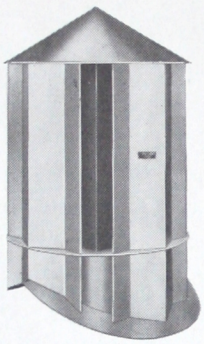


Condition No. 1: Wind strikes V-shaped face (A) of Breidert Air-X-Hauster and is deflected away and across outlet openings (C) at high velocity. A venturi action is caused which induces a secondary air motion through ventilator and out openings (C). The velocity of secondary air motion through the ventilator is in a much higher ratio to wind currents against outside surfaces than with conventional stationary types, regardless of wind direction.

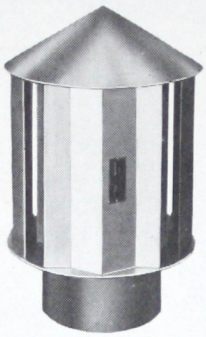


Condition No. 2: Wind strikes directly at outlet opening (C). Some wind is deflected past openings, causing siphon through inner openings (D). Wind entering directly into outlet opening is deflected past inner openings by baffles (E) causing siphon action, and passes out through other outer openings (C).

More Pleasing in Appearance



Type A



Type B

The Breidert Air-X-Hauster has been praised by many architects and builders for its compact and attractive appearance, with no unsightly mountings. The Type A is especially recommended for homes and buildings where the most pleasing appearance is desired. The base of the ventilator is hidden from view by the outer walls extending down to the roof. The wind resisting surface which is so important to the proper functioning of the ventilator is thus increased and appearance is also improved.

The Type B has the same construction as the Type A, except that the outer walls do not extend to the roof and the base is exposed to view. This base is not furnished as part of the Type B ventilator, but must be ordered separately.

Determining size and number of ventilators needed for given rate of air change

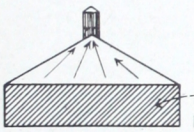


Figure 1

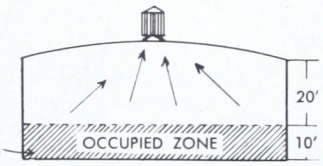


Figure 2

The standard of ventilation is based on the length of time required to exhaust the entire volume of air in a room or building. For example, assume a five minute air change is desired. Determine the cubic content of the space by multiplying the length by the width by the height: i.e., in a room 30 x 60 x 12 feet, the cubic content is 21,600 cubic feet. By dividing this content by 5, it is found that 4320 cubic feet of air per minute must be exhausted to change the air every five minutes. By referring to the ventilator capacity tables on pages *18, 19 and 20*, the proper size and number of ventilators can be selected.

In rooms with high ceilings it is not necessary to figure on changing the entire volume of air, but only that to a height of ten feet above the floor, because this is the occupied zone and space above it need not be considered. Thus, in a room thirty feet high a fifteen minute change in the entire space is equal to a five minute change in the occupied zone as indicated in Figure 2 above. This calculation will be satisfactory only if the ventilator is mounted well above the ten foot zone and fresh air is admitted low in this zone.

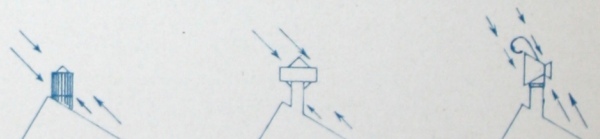
The rate of air change required in various types of buildings according to accepted standards is given below.

Restaurant and Hotel Kitchens	*2 Min.*
Residence Kitchens	*2-3 Min.*
Offices, depending on density of occupancy	*5-10 Min.*
Factory Buildings	*5-10 Min.*
Night cooling by attic ventilation	*2 Min. on floor below*
Garages (Repair Shops)	*4-6 Min.*
Theatres, Lodges, Assembly Halls	*3-4 Min.*
Laundries	*3-6 Min.*
Farm Barns	*30 CFM* per horse — 60* CFM per cow*
Stores	*5 Min.*

*Cubic feet per minute.

Higher Efficiency

The Breidert Air-X-Hauster fulfills the long-felt need for a means of moving large quantities of air at small cost from spaces or rooms directly under the roof or where it is possible to run vertical ducts to lower floors of multi-storied buildings. Confidence in the merits of the old-fashioned round type of roof ventilator (more commonly known as a "globe ventilator," which has been imitated and redesigned for many years) has steadily diminished. Architects and engineers have long known that certain types of ventilators are unsatisfactory because of annoying "down-drafts" (back-draft or reversed action) which defeat the purpose of the ventilator. Proper ventilation depends entirely on the movement of adequate volumes of air in a predetermined manner. That is, if a 10 minute



Above is shown the appearance and characteristic action of the Breidert Air-X-Hauster (left) compared to conventional round and revolving type ventilators, each set on the ridge of a saw tooth roof. Up or down air currents, indicated by arrows, do not affect the positive siphon action of the Breidert Air-X-Hauster. The round and revolving type ventilators "back up" and cause down-drafts under the same wind conditions, as shown by heavy arrows.

air change is desired, there should be no fluctuation due to a down-draft of air in the ventilator reversing the circulation and upsetting the air change.

The Breidert Air-X-Hauster is absolutely positive in action. When properly installed, you can use fewer and smaller Breidert Air-X-Hausters than conventional ventilators because of their higher efficiency. With no operating expense, they move amazingly large volumes of air. There are no fluctuations due to down-drafts or stagnation of air in the ventilator. Breidert Air-X-Hausters are also highly effective when used for night cooling by attic ventilation.

Installations on Industrial Buildings

Proper ventilation of industrial buildings is one of the most important and at the same time most neglected phases of the ventilating problem. An adequate supply of fresh air is necessary in all shops where there are a number of employees and especially where the manufacturing processes produce quantities of heat, dust or obnoxious fumes. The moving of such an amount of air often is costly by mechanical means and thus ventilation of such areas is frequently neglected. The use of Breidert Air-X-Hausters provides a means of moving a large volume of air with a low initial cost and no operating expense.

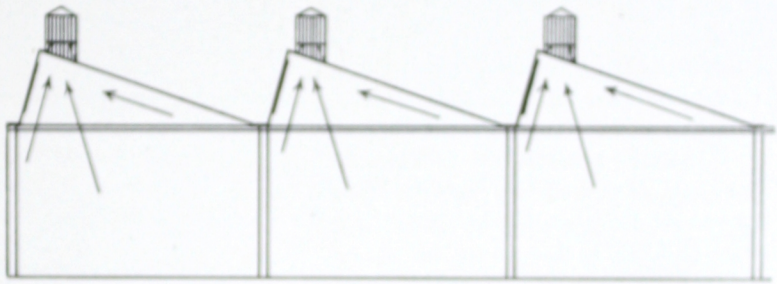


Figure 1

Figure 1 shows the application of Type A Breidert Air-X-Hausters on a saw tooth type roof. Note how the base is hidden from view. Figure 2 shows an application of a Type B Breidert Air-X-Hauster on a monitor type roof.

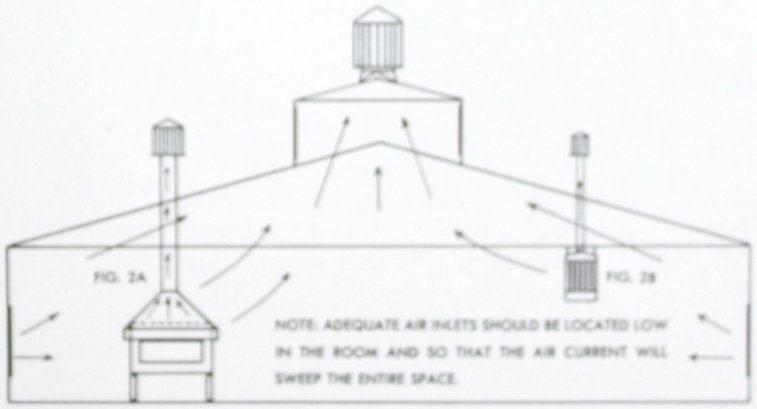


Figure 2

Ventilators should always be installed at the highest point of the roof. With the correct number for adequate ventilation thus installed it is essential to keep the saw tooth or monitor windows closed to keep the air from short circuiting. This has a further special advantage during inclement weather, when open windows would cause cold down-drafts and permit entrance of snow and rain. Closed saw tooth windows also keep out smoke and fumes from adjacent buildings.

Breidert Air-X-Hausters installed in the above manner will prevent condensation of moisture on the saw tooth windows, when it is cold outside and the inside air is warm and moist, by constantly exhausting this moisture to the outside instead of allowing it to collect on the cold windows.

A great variety of applications of Breidert Air-X-Hausters can be made in industrial plants to take care of special requirements for ventilation due to processes used or of particular sections which require separate treatment, such as offices, store rooms, locker rooms, toilet and dressing rooms, etc. Where hoods are used over ovens, vats, etc., Breidert Air-X-Hausters can be installed on stacks to increase the air movement (Note Figure 2A). Due to their "no back-draft" feature, Breidert Air-X-Hausters are especially adapted for use on "vent flues" from gas or oil burners to prevent pilot lights from blowing out (Note Figure 2B).

Installations on Commercial and Public Buildings

Figure 1 . . . Sectional view of a flat roof building showing how Breidert Air-X-Hausters may be installed to reduce the temperature in the attic space and create a very effective circulation of air. Breidert Air-X-Hausters do not "back up" and carry in odors from adjoining buildings or force the heat of the attic space down into the rooms below. Ordinary louvre ventilators in side walls fail to create a circulation or ventilate the space below the attic.

During summer months, with Breidert Air-X-Hausters installed on the roof, the cool night air is drawn through the building without the use of fans or motors. The entire building is thus pre-cooled during the night. By insulating the attic floor, the pre-cooling effect is conserved through the heat of the next day. This combination of positive ventilation with attic floor insulation will give appreciable relief to those who cannot afford a more elaborate system.

Figure 2 . . . Cross section of an arch roof building. A number of Breidert Air-X-Hausters installed on the roof along the center of the building will exhaust the heat and foul air very effectively. The Type A Breidert Air-X-Hauster with weather vanes removes the bareness of the roof line. To get best results ventilators should be installed at the highest point of the roof.

Figure 3 . . . Typical installation of Type A Breidert Air-X-Hauster on a church. The hot air is exhausted out of the attic space in the same manner as shown in Figure 1, above. This provides a double benefit, by removing the blanket of hot air from the attic and by creating a positive air movement throughout the room as indicated by arrows. The room can also be pre-cooled before services by keeping air inlets open at night to draw the cool night air through the building to absorb the heat stored up in the walls and furnishings.

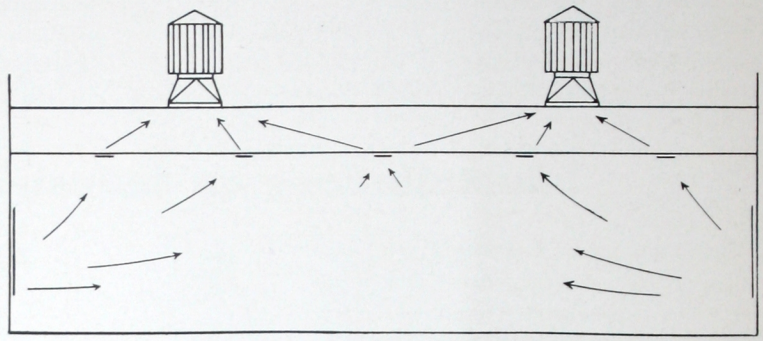


Figure 1

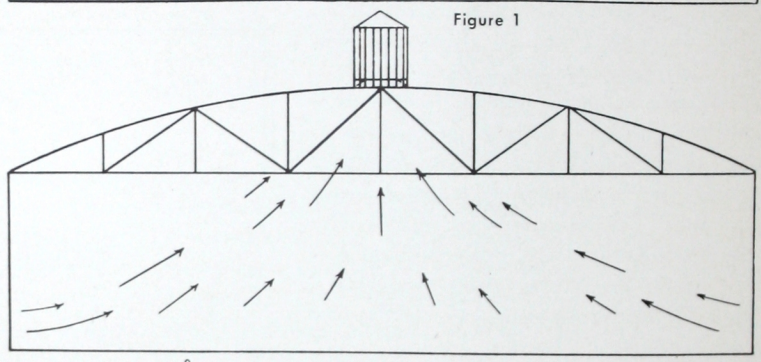


Figure 2

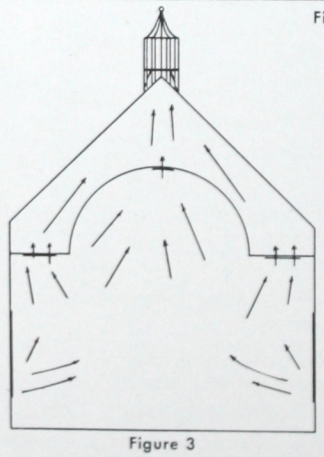


Figure 3

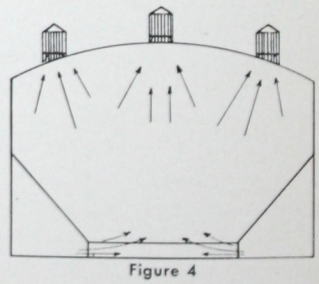
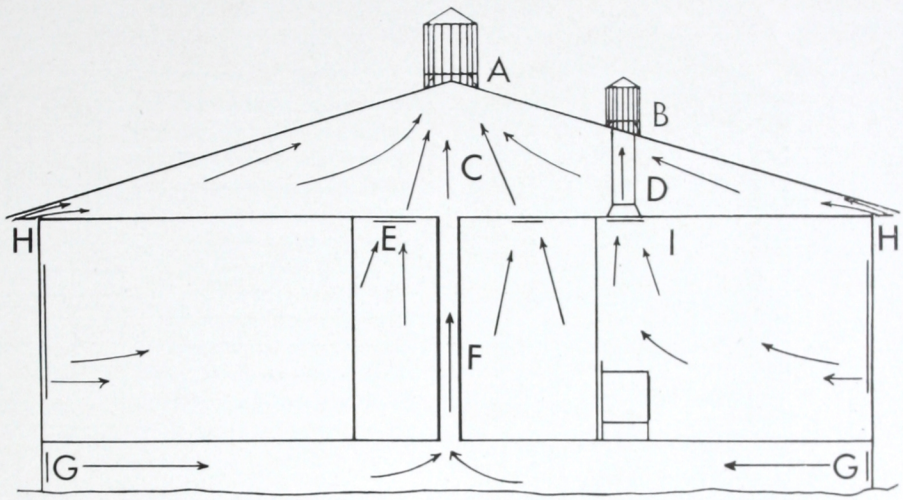


Figure 4

Figure 4 . . . Breidert Air-X-Hausters can be installed on the roof of gymnasiums, arenas and such buildings as shown to create an upward air movement through all parts of the room. Where heavy smoke prevails as in an arena, it is essential to provide sufficient ventilators to carry off the smoke rapidly. With ventilators installed on the highest point of the roof, and fresh air admitted near the floor line, a circulation as indicated with arrows will quickly carry the smoke and foul air above the occupied zone.

Installations for Residence Cooling and Ventilation



At right is shown a Breidert Air-X-Hauster (Type A) installed on the ridge of a gable-roofed residence. In ordinary construction, with no ventilation, the attic temperature in such a house will often reach 120° to 130° with only 90° outdoors. By installing one or more Type A Breidert Air-X-Hauster, the hot air in the attic space (C) is exhausted as indicated by arrows. Register openings should be placed in the ceiling of clothes closets, hallways and bathrooms, as shown at (E). Additional screened openings (¼" mesh) placed under the eave at (H) will facilitate the circulation in the attic as shown. This method of attic cooling in conjunction with insulation as mentioned on page 6 produces very effective results, particularly since the cool night air can be circulated throughout the entire house thereby pre-cooling the building for the following day.

Architects and engineers will find this method of attic cooling practical in connection with the air conditioning systems for residences, commercial buildings and offices. It reduces the load on the compressor considerably. Heat loss can be checked in winter by simply closing the registers. The screened openings at (H) likewise may be closed if desired. This system is scientifically correct and costs little more than metal dormers or louvre ventilators which are not effective.

Kitchen ventilation is now a recognized necessity. The simple yet effective system shown at (B) and (D) above is rapidly becoming popular. First, because there is no operating or maintenance cost. Second, there is no noise. Silently, night and day, a pleasing circulation of air removes every trace of cooking odors. A Breidert Air-X-Hauster (Type A) installed on the side slope of the roof, as illustrated at (B), with a vertical duct (D) down to a grill in the ceiling directly over the range, exhausts the heat and grease odors at their source (note circulation shown by arrows). Walls and decorations are protected from films of grease and accumulation of dust. This saving alone warrants the expense. A transition from the register (closing type) shown at (I) connects with vertical duct (D).

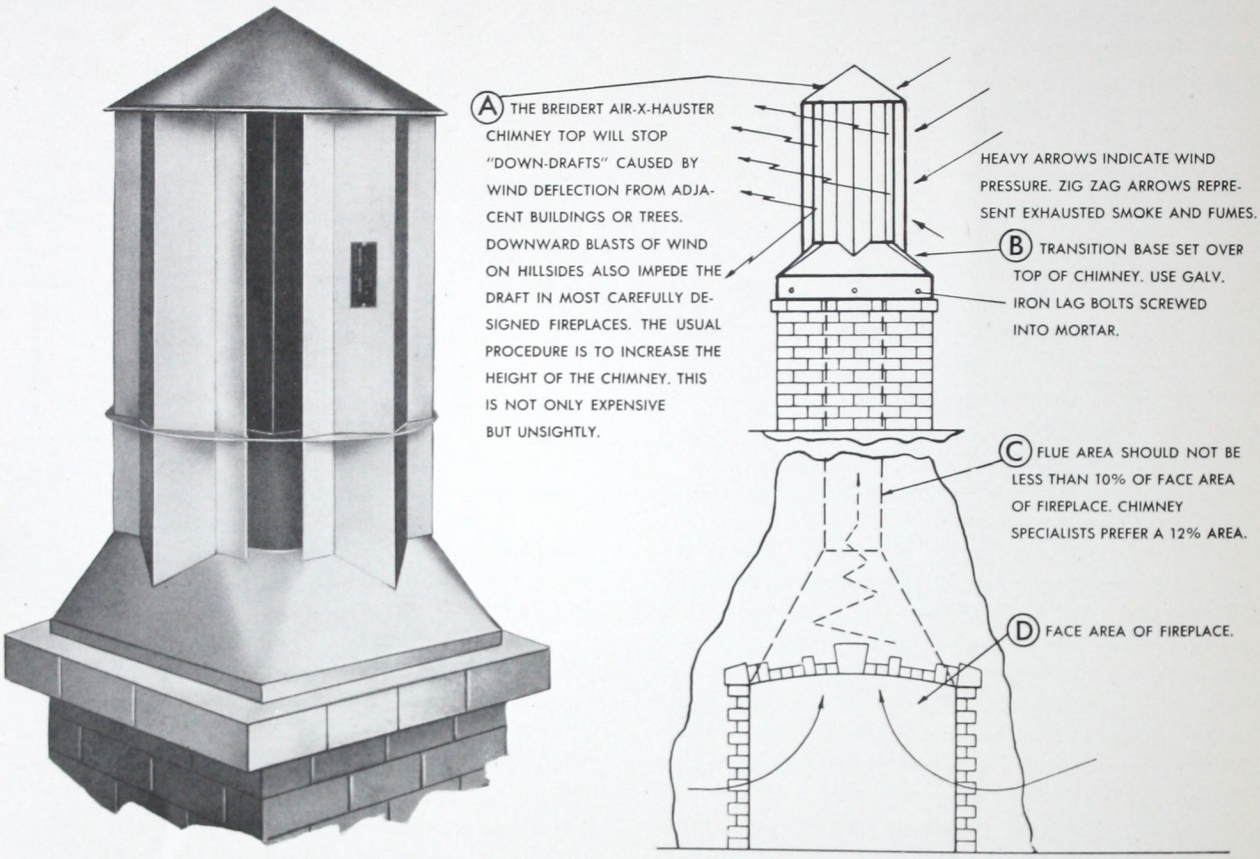
The following sizes of ventilators and registers are recommended for one story residence and bungalow kitchens in the manner shown at (B) and (D).

12" size for kitchens with 750 to 1000 cubic feet	Use 14" x 14" Louvre Registers
10" size for kitchens with 500 to 750 cubic feet	Use 12" x 12" Louvre Registers
8" size for kitchens with 500 cubic feet or less	Use 10" x 10" Louvre Registers

Termite Control

Termite control experts agree that the space below the first floor and above the ground should be kept dry and well ventilated. A simple and effective system of ventilation is shown at (F). One or more vertical ducts extending from the basement (can be located in clothes closets) as illustrated will exhaust the air from the space under the first floor, into the attic and out through the ventilator on the ridge. Fresh air is automatically drawn in through side wall louvres (screened) as shown at (G). It is now compulsory in certain building codes to install such inlet openings as shown. Much greater effect is obtained by the addition of vertical ducts to a ventilated attic as described.

Breidert Air-X-Hauster for Chimney Top



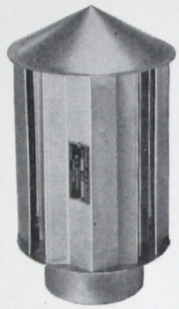
In many parts of the country fireplace chimneys and incinerator, gas boiler or furnace stacks become sluggish and subject to back-draft due to adverse high winds deflected downward from tall trees, adjacent buildings and hillsides. This is particularly true where residences are on hillsides or in mountain canyons. Smoky fireplaces make the room uninhabitable and damage decorations.

The drawing above shows the proper application of a Breidert Air-X-Hauster on a fireplace chimney. Contributing causes for sluggish flue action are (a) obstructions and heavy accumulation of soot in the flue (b) lack of air supply to the fire. Chimneys will not draw if the room or building has no source of air supply. A window (or special air inlet) should be slightly opened elsewhere in the house to admit air to relieve the vacuum caused by the ventilator. Excessive smoke is caused by accumulation of ashes. A fire grate creates better fuel combustion and should be used, as a fire burns more freely if air is drawn in under the grate.

The size of the ventilator required is governed by the size of the flue. Note (C) in drawing. The area of the ventilator neck should be equal to, or slightly larger than the area of the flue. On double flue chimneys a single ventilator can be used. Simply figure the combined area of both flues and select a ventilator with the same total area. See page 13 for areas, etc.

Breidert Air-X-Hausters for Chimney Tops are made in sizes 8, 9, 10, 12, 14 and 16-inch, with bases to fit chimney. Dimensions are the same as the Type B-2 Breidert Air-X-Hauster (see pages 12, 13). All Chimney Tops are made of 20-gauge galvanized steel. Bases are not included as part of Chimney Tops.

Breidert Air-X-Hauster Vent Flue Caps



Although there has been a great advance in combustion efficiency, too little thought is given to down-drafts in flues caused by adverse outside wind.

The most efficient heaters—using oil, gas or any other fuel — often perform quite differently in the field than in factory laboratories. This is generally due to varying wind conditions and downward wind pressure caused by adjacent high buildings, trees or hilly country. Our attention has been called to many high grade heaters which in one section performed in a most efficient manner, while in another it was difficult to keep pilot lights burning. In such cases, the first step is usually to turn up the pilot light which means greater gas consumption. This is a dangerous procedure in the event the pilot light is blown out, as the unburned gas will not rise upward into the flue if the draft is unsteady due to frequent down-draft.

There is one safe solution—namely, a Breidert Air-X-Hauster, which induces a draft when the wind blows instead of choking the flue and causing a down-draft. Many severe tests have been made with the Breidert Air-X-Hauster ventilator in which it proved vastly superior to other vent flue caps in creating a suction and preventing back-drafts. It is more compact and neater in appearance.

The drawings on this page show the relative appearance of various types of vent flue caps of equal size as used in different parts of the country. The most commonly used heretofore is the plain double vent cap, Figure 1, and the "A" shaped vent, Figure 2. Both of these must be set high above a roof or parapet wall in order to avoid eddy currents caused by wind deflected from adjacent buildings, etc. In an identical application the Breidert Air-X-Hauster need not be set so high. In fact, it can be set next to a pitched roof as shown in Figure 3.

Heretofore it has been a practice to use individual flues for each heater on gas unit heaters, floor or wall types. This applies to residence heaters in territories where gas heat is commonly used. It is now practical to run several vent flues to one large Breidert Air-X-Hauster centrally located, as shown in Figure 4. This combines all vent outlets into one, thus eliminating the unsightly appearance of so many vent caps on a roof, and also saving on the cost. The area of the ventilator neck should equal the combined area of the flues leading into it.

Figure 5 illustrates another novel application. Here is shown a simple method of running one or more vent flues to a larger size Breidert Air-X-Hauster on the ridge with the balance of the ventilator neck left open to exhaust the attic heat. This is similar to the system shown on page 7 pertaining to residence cooling with night air.

NOTE: Ordinances in some cities covering vent flue applications were enacted prior to the development of the Breidert Air-X-Hauster. It may be necessary to secure the approval of your local building commission before making installations.

Vent flue cap sizes and dimensions are shown on pages 12 and 13.

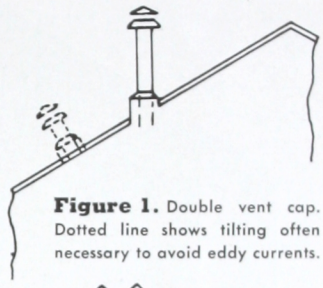


Figure 1. Double vent cap. Dotted line shows tilting often necessary to avoid eddy currents.

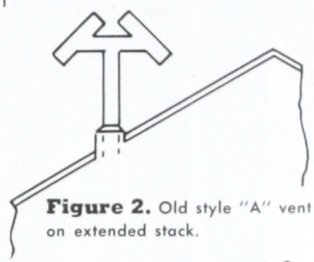


Figure 2. Old style "A" vent on extended stack.

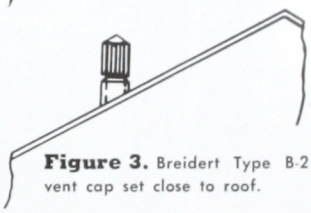


Figure 3. Breidert Type B-2 vent cap set close to roof.

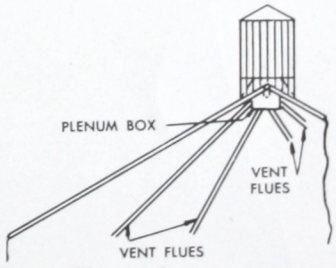


Figure 4. Larger size Breidert Air-X-Hauster handling a series of flues. Plenum box can be insulated with asbestos.

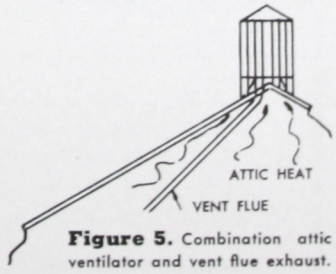
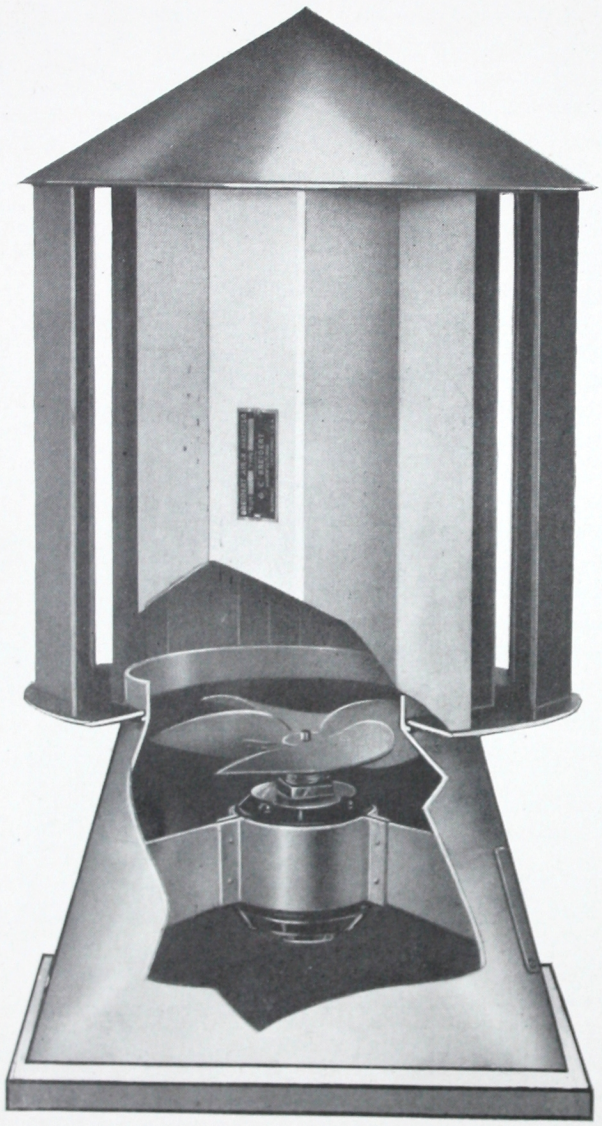


Figure 5. Combination attic ventilator and vent flue exhaust.

Breidert Air-X-Hauster Motor and Fan Assemblies



Type MFS motor and fan assemblies can be installed in existing ventilators. Or this type ventilator can be built for a motor and fan assembly but erected less the assembly, which can be installed later. Write for further information.

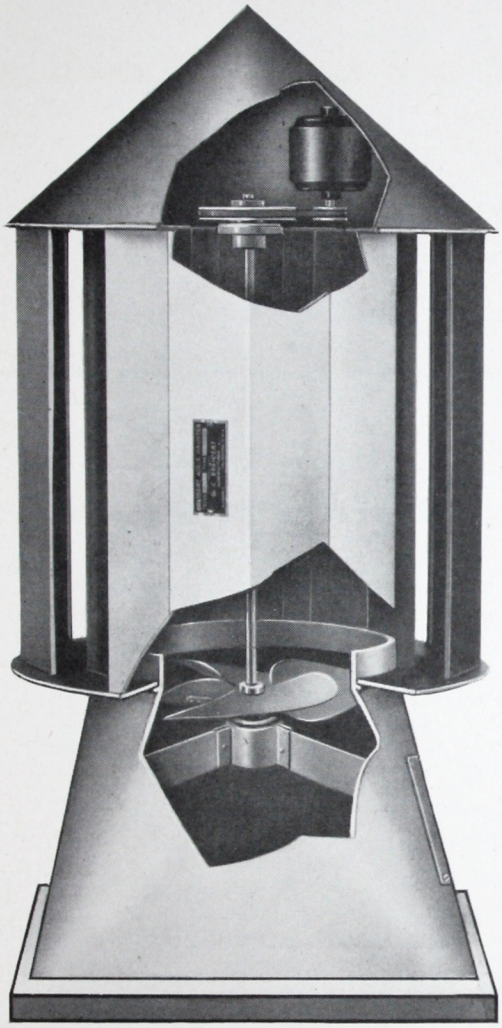
When greater capacity is required on any ventilator installation than normal wind velocity will give, Breidert Air-X-Hausters can be equipped with motor driven fans. These fans are mounted in the base below the neck of the ventilator. The fan blade is the full diameter of the ventilator neck. The flare of the base gives clearance around the fan blades and compensates for the space occupied by the motor and fan blades. Thus the full capacity of the ventilator is retained when operating under natural draft only. This type of Breidert Air-X-Hauster is furnished only with the fan mounted in the base, which becomes part of the ventilator. See curb construction on next page.

With the wind blowing across the ventilator head at the same time the fan is operating, the output is increased by the natural suction of the ventilator in proportion to the wind velocity. This is the opposite effect to that of wind on an ordinary ventilating fan where the wind tends to reduce the capacity rather than to increase it. This makes the Breidert Air-X-Hauster, equipped with motor and fan, much more efficient than the ordinary type of exhaust fan installed in a penthouse. Such a Breidert Air-X-Hauster installation continues to act as a natural draft ventilator with full capacity during the night time or when the fan is not running. A fan in a penthouse has no appreciable action of this kind. A space equipped with such Breidert Air-X-Hausters will therefore be thoroughly ventilated and cooled by the circulation of night air through it.

Breidert Fan Type MFS

In the Type MFS Breidert Air-X-Hauster (left), the fan blade is mounted on the motor shaft up to and including the 24-inch size and the assembly is supported on a suspension bracket below the neck of the ventilator. On the 30-inch and larger sizes the fan is driven by a V belt and the motor is mounted to one side. Provision is made for oiling these assemblies from outside the ventilator when necessary. Access to the motor is through the neck of the ventilator when the installation is such that this opening is within reach. If not accessible in this manner, the entire ventilator head, up to the 16-inch size on the Type MFS, can be lifted off. On larger sizes a weather-proof access door is provided in the base.

THE BREIDERT AIR-X-HAUSTER



Breidert Fan Type MC

In the Type MC Breidert Air-X-Hauster (left), the fan blade is mounted in the base in the same location as in Type MFS, but the shaft is extended upward through the center of the ventilator. The motor is mounted inside of the conical top of the ventilator directly connected to the extended shaft on sizes up to and including the 24-inch. On 30-inch and larger sizes the motor is offset and the fan shaft is driven by a V belt.

On this type there is a solid top to the ventilator body which completely separates the motor compartment from the exhaust air passage. This motor space is well ventilated by outside air through a slot at the bottom edge completely around the cone.

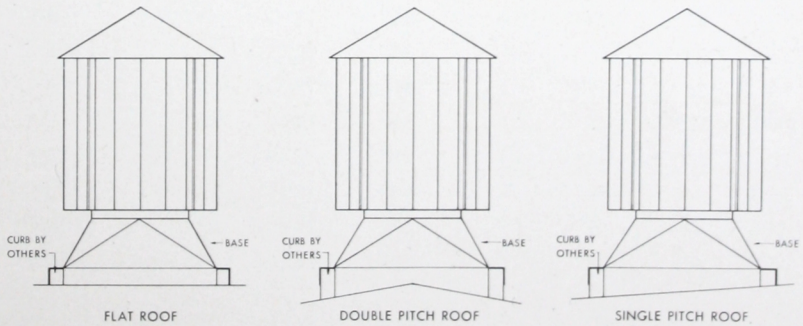
The Type MC has a great advantage over the Type MFS in that the motor is out of the path of the exhaust air. It is therefore protected against dust, moisture, fumes, excessive heat, etc., which may be present in the exhaust. It operates in a space well ventilated by circulation caused by wind pressure on the outside.

On the Type MC Breidert Air-X-Hauster, access to the motor is had by removing the top cone on sizes up to 20 inches. On larger sizes an access door is provided in the cone. The lower fan shaft bearing is lubricated through a tube leading from the bearing to a fitting on the outside of the base.

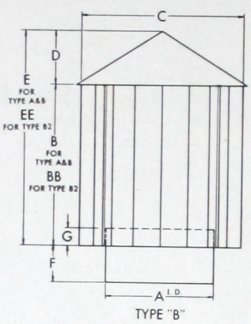
Types MFS and MC can be used in any of the applications for Type A or Type B ventilators described elsewhere in this book. Type MFS motor and fan assemblies can be applied to existing ventilators if desired.

Curb Construction

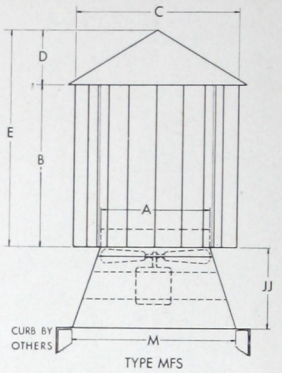
Types MFS and MC assemblies are supplied in FR4 bases only. Diagrams show how curbs should be constructed by customer on various types of roofs to fit the FR4 base.



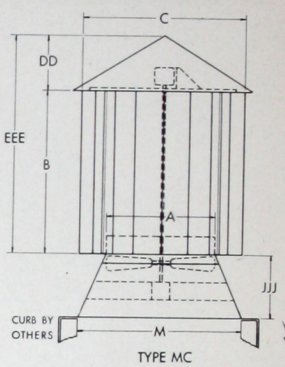
Construction Details of the Brei



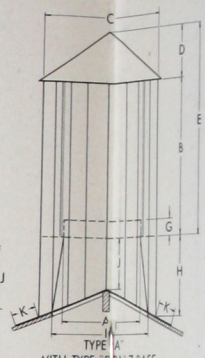
TYPE "B"



TYPE MFS



TYPE MC



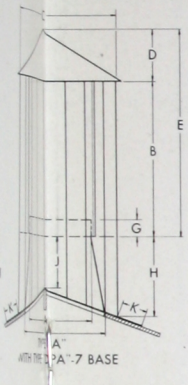
TYPE "A"
WITH TYPE "C" PA-7 BASE

Overall Dimensions

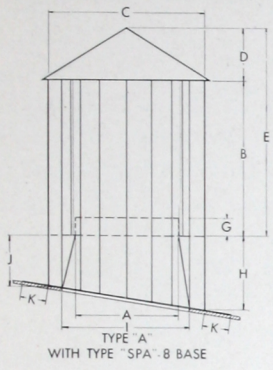
SIZE OF VENT	A	B	BB	C	D	E	EE	F	G	H	I(DIAM.)	J	K	M	P	DD
4	4″	6″	8″	6″	2″	8″	10″	2″	1″							
5	5″	7½″	10″	7½″	2½″	10″	12½″	2″	1″							
6	6″	9″	12″	9″	3″	12″	15″	2″	1″							
7	7″	10½″	14″	10½″	3½″	14″	17½″	2½″	1¼″							
8	8″	12″	16″	12″	4″	16″	20″	2½″	1½″		10″	4″	6″			
9	9″	13½″	18″	13″	4½″	18″	22½″	3″	1½″		11¼″	4½″	6″			
10	10″	15″	20″	15″	5″	20″	25″	3½″	2″		12½″	5″	6″			
12	12″	18″	24″	18″	6″	24″	30″	4″	2″		15″	6″	6″	18″	3″	11
14	14″	21″		21″	7″	28″		4½″	2¼″		17½″	7″	6″	21″	3″	13
16	16″	24″		24″	8″	32″		5½″	2½″		20″	8″	6″	24″	3″	14
18	18″	27″		27″	9″	36″		6″	3″		22½″	9″	6″	27″	3″	16
20	20″	30″		30″	10″	40″		6½″	3½″		25″	10″	6″	30″	3″	17
22	22″	33″		33″	11″	44″		7″	3½″		27½″	11″	6″	33″	3″	
24	24″	36″		36″	12″	48″		8″	4″		30″	12″	6″	36″	3″	20
26	26″	39″		39″	13″	52″		8″	4¼″		32½″	13″	6″	39″	3″	
28	28″	42″		42″	14″	56″		9″	4½″		35″	14″	6″	42″	3″	
30	30″	45″		45″	15″	60″		10″	5″		37½″	15″	8″	45″	4″	
36	36″	54″		54″	18″	72″		12″	6″		45″	18″	10″	54″	4″	26
42	42″	63″		63″	21″	84″		14″	7″		52½″	21″	12″	63″	4″	30
48	48″	72″		72″	24″	96″		18″	8″		60″	24″	12″	72″	4″	35
																39

ACCORDING TO PITCH OF ROOF

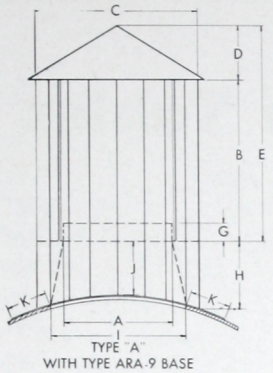
the Breidert Air-X-Hauster



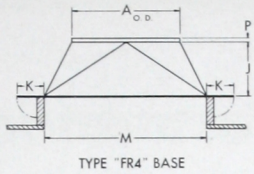
TYPE "A"
WITH TYPE "SPA"-7 BASE



TYPE "A"
WITH TYPE "SPA"-8 BASE



TYPE "A"
WITH TYPE ARA-9 BASE



TYPE "FR4" BASE

Do not use plain round bases on 12" type B or larger ventilators. The square to round base "FR4," shown is more efficient, stronger, and neater looking.

Approximate Net Weights

M	P	DD	EEE	JJ	JJJ	AREA NECK SQ. IN.	AREA NECK SQ. FT.	CIRC. NECK IN.	GA. METAL	TYPE A	TYPE B	TYPE B2	TYPE FR4 BASE
						12.5	.087	12.5	26			3	
						19.6	.139	15.7	26			4	
						28.3	.196	18.8	26			6	
						38.5	.267	22.0	26			8	
						50.3	.350	25.1	24	18	11	13	
						63.6	.441	28.3	24	22	14	16	
						78.5	.545	31.4	24	28	17	19	
18"	3"	11	29	18	14	113.1	.785	37.7	24	33	23	27	8½
21"	3"	13	34	18	14	153.9	1.07	44.0	24	45	30		10½
24"	3"	14	38	18	14	201.1	1.40	50.3	24	57	40		13
27"	3"	16	43	20	14	254.5	1.77	56.5	24	68	50		15
30"	3"	17	47	20	14	314.2	2.18	62.8	22	98	73		21
33"	3"					380.1	2.64	69.1	22	118	90		24
36"	3"	20	56	22	20	452.4	3.14	75.4	22	140	107		27
39"	3"					530.9	3.69	81.7	22	160	125		31
42"	3"					615.7	4.27	88.0	22	185	145		34
45"	4"	26	71	28	20	706.9	4.91	94.2	20	250	190		52
54"	4"	30	84	28	22	1017.9	7.07	113.1	20	365	280		75
63"	4"	35	98	30	22	1385.4	9.62	132.0	20	525	385		130
72"	4"	39	111	30	24	1809.6	12.57	150.8	20-18	835	650		160

Performance Tables

TYPES MFS & MC

Vent. Size	Fan Size	Fan RPM	Motor HP	Static Pressure .0"	.1"	.125"	.2"	.25"
				CFM Capacity				
12"	12"	*1140	*1/20	1000	865	827	695	575
		1725	1/8	1485	1395	1370	1300	1250
14"	14"	*11.40	*1/20	1290	....	....	....	....
		1140	1/12	1290	1130	1085	960	865
		1725	1/4	1930	1840	1790	1710	1655
16"	16"	*1140	*1/12	1770	....	....	....	....
		1140	1/8	1770	1655	1625	1510	1415
		1725	1/3	2660	2575	2555	2480	2430
18"	18"	*1140	*1/6	2340	2140	2080	1900	....
		1725	1/2	3560	3440	3410	3310	3240
20"	20"	*1140	*1/4	2690	2400	2350	2225	2150
24"	24"	*1140	*1/3	4490	4280	4220	4040	....
		1140	1/2	4490	4280	4220	4040	3870
30"	30"	* 750	*1/2	7450	6770	6575	....	....
		720	1/2	7150	6500	6325	5535	4885
		825	3/4	8200	7450	7260	6350	5620
36"	36"	* 600	*3/4	10000	7750	7460	....	....
		565	3/4	9400	7450	6915	4300	2655
		635	1	10600	8350	7910	6550	5880
42"	42"	* 575	*1	13000	9750	9000	6950	5700
		660	1-1/2	14915	12250	11550	9850	8745
48"	48"	* 550	*1-1/2	16500	13250	12650	11125	10340
		640	2	19200	16500	15900	14250	13475

*Standard motor H.P. and speeds.

For capacities at static pressures not listed refer to factory for special combinations of fan blades and motors.

Do not attempt to use Breidert Type MFS or MC Air-X-Hausters for static pressures higher than ¼". Propeller-type fans are not adapted to the higher pressures, as too great a strain is placed on the fan blades causing excessive vibration. The efficiency is also low. For such installations, use blowers.

The capacity of Breidert Air-X-Hausters, as determined by air velocity through neck of ventilator, is governed by three factors: wind velocity across head of ventilator, height ventilator is mounted above air intake to room, and difference in temperature between interior and exterior of room.

Many tests have proved that the Breidert Air-X-Hauster has the very high ratio of 1 to 2 for relative velocity of air exhausted through ventilator to velocity of outside wind. This velocity through the ventilator is due to the suction action of wind blowing across ventilator head. The chart at bottom right shows this relationship.

To this velocity must be added the stack action caused by mounting height and temperature difference. The table at top right gives this added velocity for various heights and temperature differences. The capacity in cubic feet per minute (CFM) of any size ventilator can then be determined from the sum of these velocities multiplied by the area of the ventilator neck in square feet . . . See table page 13.

Example: A 5-mile wind produces a velocity through the ventilator of 220 feet per minute. With a ventilator mounted 15 feet above the floor, and a temperature difference of 20° between inside and outside air, there is an added velocity of 188 feet per minute due to the stack action. Thus the total velocity through the ventilator under these conditions is 408 feet per minute. A 12-inch ventilator has .785 square feet neck area; 408 feet per minute velocity multiplied by .785 square feet area gives 320 CFM. A 12-inch ventilator under these conditions therefore has a capacity of 320 CFM. Capacities for any size and for any given conditions can be similarly determined. Tables on pages 18, 19 and 20 give capacities on this basis for different ventilator sizes with various combinations of wind velocity, mounting height and temperature differences.

Capacity and Performance Tables

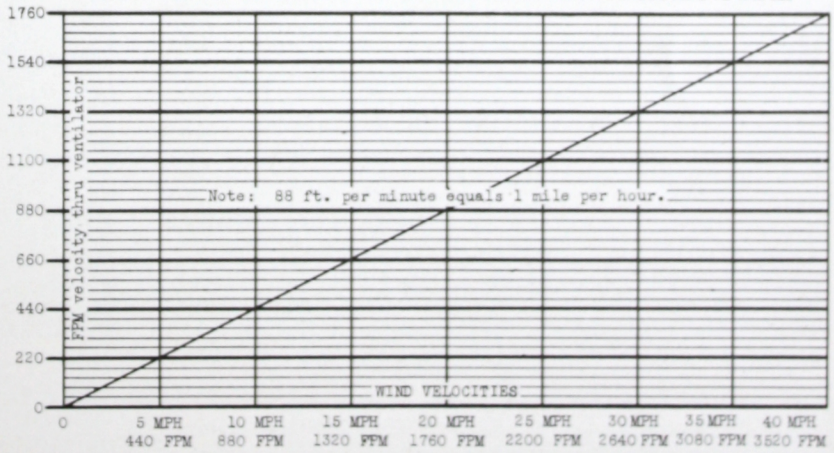
FLOW OF AIR IN FLUES BY NATURAL DRAFT IN CUBIC FEET PER MINUTE

AREA ONE SQUARE FOOT

DIFFERENCE IN TEMP. FAHR.	HEIGHT OF FLUE IN FEET SAME AS HEIGHT OF ROOM OR BUILDING								
	10	15	20	30	40	50	60	80	100
10	108	133	153	188	217	242	264	306	342
15	133	162	188	230	265	297	325	375	420
20	153	188	217	265	306	342	373	435	485
25	171	210	242	297	342	383	420	485	530
30	188	230	265	325	375	419	461	530	594
40	216	265	305	374	431	482	529	608	680
50	242	297	342	419	484	541	594	680	768
60	266	327	376	460	532	595	650	747	842

BREIDERT AIR-X-HAUSTER CAPACITY CHART

FEET VELOCITIES THRU VENTILATOR COMPARED WITH WIND VELOCITIES.
NOTE: ADD EXTRA VELOCITY FOR TEMPERATURE DIFFERENCE. SEE ABOVE TABLE.



Rigid Tests Prove Efficiency of Breidert Air-X-Hausters

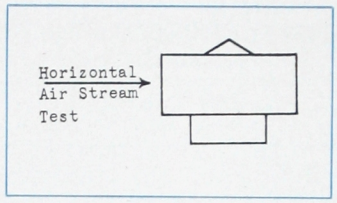
Ventilating standards fifty years old or more are entirely inadequate for modern needs. Breidert Air-X-Hausters are designed to meet entirely *new* standards—the highest yet set up for natural draft ventilators. The methods used in testing the efficiency of the Breidert Air-X-Hauster under all wind conditions were probably the most severe ever devised and applied to a ventilator.

These tests, made in the San Francisco laboratories of Smith, Emery & Co., Pacific Coast branch of the Pittsburgh Testing Laboratories, involved the use of a wind tunnel similar to those used in testing airplanes (see photographs below).

Equally severe tests have been made by other recognized, highly official authorities, with similar results.

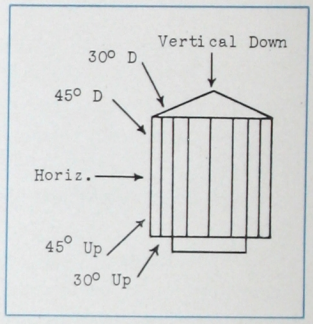
THE OLD METHOD

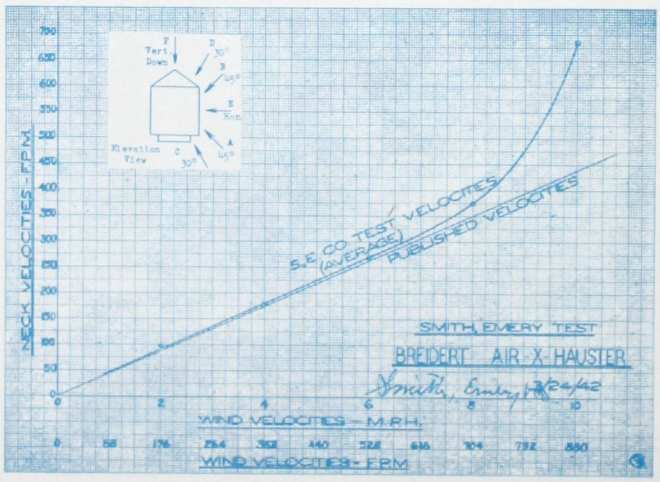
Under old testing methods, ventilators are required to show results only with the wind blowing on a horizontal plane. Such tests cannot reveal true performance under actual operating conditions. Actually, variable wind conditions generally prevail which cause air currents to strike at various angles. In addition, obstructions change the course of the wind, causing it to become turbulent and to strike at many angles simultaneously. With some ventilators, wind striking at angles other than horizontal causes severe down-drafts or stagnation.



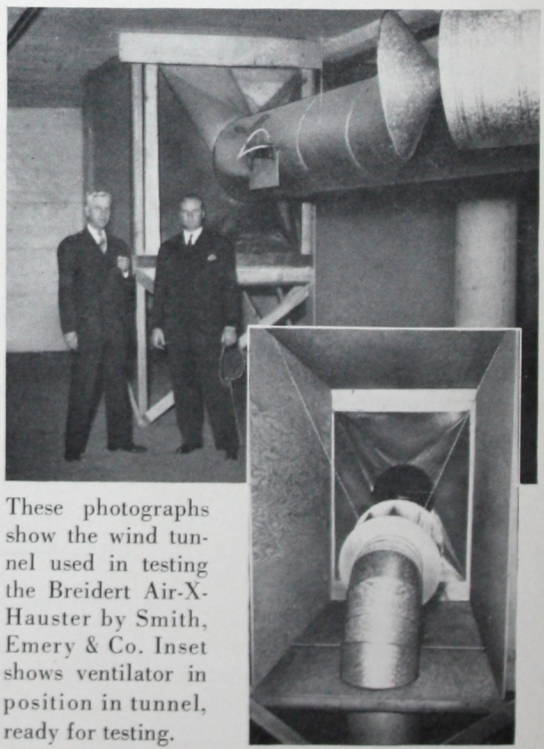
THE BREIDERT METHOD

The certified ratings of Breidert Air-X-Hausters are based on more than 1200 anemometer readings taken with wind pressure directed at the various angles indicated at right. *Only such testing methods can absolutely assure the scientific, positive performance of a ventilator under true wind conditions.*





Results of the Smith, Emery tests are shown on this chart. Note that test velocities, indicated by top curve, are higher than velocities claimed by the manufacturer. Note also that a wind velocity of 8 miles per hour is the critical point at which the corresponding efficiency curve of the Breidert Air-X-Hauster begins to rise sharply, due to increasing wind pressure becoming equalized all around the ventilator. With many other types of ventilators increased wind velocity means lessened efficiency.



These photographs show the wind tunnel used in testing the Breidert Air-X-Hauster by Smith, Emery & Co. Inset shows ventilator in position in tunnel, ready for testing.

SMITH, EMERY & COMPANY

ESTABLISHED 1904

ENGINEERS - CHEMISTS

651 HOWARD STREET

SAN FRANCISCO

March 24, 1942

SE.NO. 165597

Test of 16" Type B,
Breidert Air-X-Hauster

The G. C. Breidert Co.,
#3228 S. Central Ave.,
Los Angeles, Calif.

---- O ----

R E P O R T

Gentlemen:

In accordance with instructions our Mr. E.I.Rodgers has conducted tests on a 16" Type B Breidert Air-X-Hauster ventilator at 2, 4, 6, 8 and 10 miles per hour wind velocities. Tests were made between March 17 - 23 inclusive.

A 5-H.P. blower fan was used in connection with a specially constructed test tunnel to produce 2 to 10 mile velocities. No attempt was made to straighten the air stream or remove turbulence.

The ventilator was mounted on a 16" neck and anemometer readings were taken at the inlet. The anemometer was recently calibrated. No tests were made with stack or with temperature differential. The air struck the ventilator from certain angles;

a: Upward at an angle of 45° from perpendicular
b: Downward " " " 45° " "
c: Upward " " " 30° " "
d: Downward " " " 30° " "
e: Horizontally, the ventilator vertical
f: The air striking squarely on top of the ventilator cone.

There was an absence of downdraft. And at no time was there a suggestion of stagnation in the throat of the ventilator, or the inlet piece in which the readings were taken.

The following velocities were observed:

MPH	a	b	c	d	e	f
2	100	97	92	102	97	100
4	169	161	185	175	176	188
6	255	261	280	291	269	256
8	370	396	360	371	380	370
10	698	649	589	607	720	863

Respectfully submitted,

Smith, Emery & Co.

INSPECTING & TESTING ENGINEERS

Report of Smith, Emery & Co. certifying the velocities and performance of Breidert Air-X-Hausters, and stating conditions of tests. Note paragraph regarding the absence of down-draft or stagnation.

8" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — .350 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	100	108	115	121	127	138	146	154
	15 "	108	118	127	135	142	154	166	175
	20 "	115	127	138	146	154	169	181	192
	25 "	121	135	146	156	166	181	196	209
	30 "	127	142	154	165	175	193	208	223
	40 "	137	154	168	180	192	212	230	247
	50 "	146	166	181	195	208	231	251	270
	60 "	155	176	193	208	223	248	270	289
5	10 ft.	115	124	131	137	143	153	162	169
	15 "	124	134	143	150	158	170	181	191
	20 "	131	143	153	161	170	184	197	207
	25 "	137	151	162	171	181	197	211	224
	30 "	143	158	170	180	191	208	224	238
	40 "	153	170	184	196	208	228	246	263
	50 "	162	181	197	210	234	246	266	285
	60 "	170	191	209	223	238	263	285	305
6	10 ft.	130	139	146	152	158	168	177	185
	15 "	139	149	158	166	173	185	196	206
	20 "	146	158	168	177	185	200	212	223
	25 "	152	166	177	187	196	212	226	239
	30 "	158	173	185	195	206	224	239	254
	40 "	168	185	199	211	223	243	261	278
	50 "	177	196	212	225	238	261	281	300
	60 "	186	207	224	239	253	279	301	320
8	10 ft.	161	170	177	183	189	199	208	216
	15 "	170	180	189	196	204	216	227	237
	20 "	177	189	199	208	216	230	243	254
	25 "	183	197	208	218	227	243	258	271
	30 "	189	204	216	226	237	254	270	285
	40 "	199	216	230	242	254	274	292	309
	50 "	208	227	243	256	269	292	312	330
	60 "	216	238	255	270	284	309	331	351
10	10 ft.	192	200	208	214	220	230	239	246
	15 "	200	211	220	227	235	247	258	268
	20 "	208	220	230	238	246	260	273	283
	25 "	214	227	239	248	258	274	288	301
	30 "	220	234	247	257	268	285	301	315
	40 "	230	247	261	273	285	305	323	340
	50 "	239	258	274	287	300	323	343	361
	60 "	247	268	286	300	315	340	362	381
12	10 ft.	223	231	238	244	251	261	269	277
	15 "	231	241	251	258	265	277	289	298
	20 "	238	251	261	269	277	292	305	315
	25 "	245	258	270	279	288	304	318	332
	30 "	251	265	277	288	298	316	331	346
	40 "	260	277	291	303	316	336	353	370
	50 "	270	288	304	318	331	354	373	392
	60 "	277	300	316	331	346	371	393	412

10" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — .545 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	155	168	179	189	198	214	228	240
	15 "	168	184	198	210	221	240	258	273
	20 "	179	198	214	222	240	263	282	299
	25 "	189	210	228	243	258	282	305	325
	30 "	198	221	240	257	273	300	324	348
	40 "	214	240	262	281	300	331	359	384
	50 "	228	258	282	303	324	360	391	420
	60 "	241	274	301	324	347	386	420	450
5	10 ft.	179	192	203	213	222	238	252	264
	15 "	192	208	222	234	245	264	282	297
	20 "	203	222	238	246	264	287	306	323
	25 "	213	234	252	267	282	306	329	349
	30 "	222	245	264	281	297	324	342	371
	40 "	238	264	286	305	324	355	383	408
	50 "	252	282	306	327	348	384	415	444
	60 "	265	298	325	248	371	410	444	474
6	10 ft.	203	216	227	237	246	262	276	288
	15 "	216	232	246	258	269	288	306	321
	20 "	227	246	262	270	288	311	330	347
	25 "	237	258	276	291	306	330	353	373
	30 "	246	269	288	305	321	348	372	395
	40 "	262	288	310	329	348	379	407	432
	50 "	276	306	330	351	372	408	439	468
	60 "	289	322	359	372	395	434	468	498
8	10 ft.	251	264	275	285	294	310	324	336
	15 "	264	280	294	306	317	336	354	369
	20 "	275	294	310	318	336	359	378	395
	25 "	285	306	324	339	354	378	401	421
	30 "	294	317	336	353	369	396	420	443
	40 "	310	336	358	377	396	327	455	480
	50 "	324	354	378	399	420	456	487	516
	60 "	337	370	397	420	443	482	515	546
10	10 ft.	299	312	323	333	342	358	372	384
	15 "	312	328	342	354	365	384	402	417
	20 "	323	342	358	366	384	407	426	443
	25 "	333	354	372	387	402	426	449	469
	30 "	342	365	384	401	417	444	468	491
	40 "	358	384	406	425	444	475	503	528
	50 "	372	402	426	447	468	504	535	564
	60 "	385	418	445	468	491	530	564	594
12	10 ft.	347	360	371	381	390	406	420	432
	15 "	360	376	390	402	413	432	450	415
	20 "	371	390	406	414	432	455	474	491
	25 "	381	402	420	435	450	474	497	517
	30 "	390	413	432	449	465	492	516	539
	40 "	406	432	454	473	492	523	551	576
	50 "	420	450	474	495	516	552	583	612
	60 "	433	466	493	516	539	578	612	642

12" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — .785 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	223	242	258	271	286	308	328	345
	15 "	242	265	286	302	319	346	371	393
	20 "	258	286	308	327	346	378	406	431
	25 "	272	303	328	349	371	406	439	468
	30 "	286	319	346	370	393	432	467	500
	40 "	306	346	377	404	432	476	516	553
	50 "	328	371	406	436	467	518	563	604
	60 "	347	395	433	466	499	556	605	648
5	10 ft.	258	277	293	306	321	343	363	380
	15 "	277	300	321	337	354	381	404	428
	20 "	293	321	343	362	381	413	441	466
	25 "	307	338	363	394	406	441	474	503
	30 "	321	354	381	405	428	467	502	535
	40 "	343	381	412	439	467	511	551	588
	50 "	363	405	441	471	502	553	598	639
	60 "	382	430	468	501	534	591	640	683
6	10 ft.	292	311	327	340	355	377	397	414
	15 "	311	334	355	321	388	415	440	462
	20 "	327	355	377	396	415	447	475	500
	25 "	341	372	397	418	440	475	508	537
	30 "	355	388	415	439	462	501	536	569
	40 "	377	415	446	473	501	545	585	622
	50 "	397	440	475	505	536	587	632	673
	60 "	416	464	502	535	568	625	676	717
8	10 ft.	361	380	396	409	424	446	466	483
	15 "	380	403	424	440	457	484	509	531
	20 "	396	424	446	465	484	516	544	569
	25 "	410	438	466	487	509	544	577	606
	30 "	424	457	484	508	531	570	605	638
	40 "	446	484	515	542	570	614	654	691
	50 "	466	509	544	574	605	656	701	742
	60 "	485	533	571	604	639	694	743	786
10	10 ft.	430	449	465	478	493	515	535	552
	15 "	449	472	493	509	526	553	578	600
	20 "	465	493	515	534	553	585	613	638
	25 "	479	510	535	556	578	613	646	675
	30 "	493	526	553	577	600	639	674	707
	40 "	515	553	584	611	639	683	723	760
	50 "	535	578	613	643	674	725	770	811
	60 "	554	602	640	673	706	763	812	855
12	10 ft.	499	518	534	547	562	584	604	621
	15 "	518	541	562	578	595	622	647	669
	20 "	534	562	584	603	622	654	682	707
	25 "	548	579	604	625	647	682	715	744
	30 "	562	595	622	646	669	708	743	776
	40 "	584	622	653	680	708	752	792	829
	50 "	604	647	682	712	743	794	839	880
	60 "	623	671	709	742	775	832	881	924

14" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 1.07 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	304	330	352	370	389	420	447	470
	15 "	330	361	389	412	434	472	506	537
	20 "	352	389	420	447	472	515	554	587
	25 "	371	413	447	476	506	554	598	637
	30 "	389	434	472	504	536	589	636	681
	40 "	419	471	514	551	588	649	704	754
	50 "	447	506	554	595	636	706	767	824
	60 "	473	538	590	635	680	757	825	884
5	10 ft.	351	377	399	417	436	467	494	517
	15 "	377	408	436	459	481	519	553	584
	20 "	399	436	467	494	519	562	601	634
	25 "	418	460	494	523	553	601	645	684
	30 "	436	481	519	551	583	636	683	728
	40 "	466	518	561	598	635	696	751	801
	50 "	494	553	601	642	683	753	814	871
	60 "	520	565	637	682	727	804	872	931
6	10 ft.	398	424	446	464	483	514	541	564
	15 "	424	455	483	506	528	566	600	631
	20 "	446	483	514	541	566	609	648	681
	25 "	465	507	541	570	600	648	692	731
	30 "	483	528	566	598	630	683	730	775
	40 "	513	565	608	645	682	743	798	848
	50 "	541	600	648	689	730	800	861	918
	60 "	567	632	684	729	774	851	919	978
8	10 ft.	493	519	541	559	578	609	636	659
	15 "	519	550	578	601	623	661	695	726
	20 "	541	578	609	636	661	704	743	776
	25 "	560	602	636	665	695	743	787	826
	30 "	578	623	661	693	725	778	825	870
	40 "	608	660	703	740	777	838	893	943
	50 "	636	695	743	784	825	895	956	1013
	60 "	662	727	779	824	869	946	1014	1073
10	10 ft.	587	613	635	653	672	703	730	753
	15 "	613	644	672	695	717	755	789	820
	20 "	635	672	703	730	755	798	837	870
	25 "	654	696	730	759	789	837	881	920
	30 "	672	717	755	787	819	872	919	964
	40 "	702	754	797	834	871	932	987	1037
	50 "	730	789	837	878	919	989	1050	1107
	60 "	756	821	873	918	963	1040	1108	1167
12	10 ft.	681	707	729	747	766	797	824	847
	15 "	707	738	766	789	811	849	883	914
	20 "	729	766	797	824	849	892	931	931
	25 "	748	790	824	853	883	931	975	1014
	30 "	766	811	849	881	913	966	1013	1058
	40 "	796	848	891	928	965	1026	1081	1131
	50 "	824	883	931	972	1013	1083	1144	1201
	60 "	850	915	967	1012	1057	1134	1202	1261

16" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 1.40 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	20 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	397	432	460	484	509	550	585	616
	15 "	432	473	509	539	568	617	662	701
	20 "	460	509	550	583	617	674	725	768
	25 "	485	540	585	623	662	725	782	834
	30 "	509	585	617	659	701	771	833	891
	40 "	548	617	673	721	770	849	921	987
	50 "	585	662	725	778	833	924	1003	1078
	60 "	618	704	772	831	890	991	1079	1156
5	10 ft.	459	494	522	546	571	612	647	678
	15 "	494	535	571	601	630	679	724	763
	20 "	522	571	612	645	679	736	787	830
	25 "	547	602	647	685	724	787	844	896
	30 "	571	647	679	721	763	833	895	953
	40 "	610	679	735	783	832	911	983	1049
	50 "	647	724	787	840	895	986	1065	1140
	60 "	680	766	834	893	952	1053	1141	1218
6	10 ft.	521	556	584	608	633	674	709	740
	15 "	556	597	633	663	692	741	786	825
	20 "	584	633	674	707	741	798	849	892
	25 "	609	664	709	747	786	849	906	958
	30 "	633	709	741	783	825	895	957	1015
	40 "	672	741	797	845	894	973	1045	1111
	50 "	709	786	849	902	957	1048	1127	1202
	60 "	742	828	896	955	1014	1115	1203	1280
8	10 ft.	644	679	707	731	756	797	832	863
	15 "	679	720	756	786	815	864	909	948
	20 "	707	756	797	830	864	921	972	1015
	25 "	732	787	832	870	909	972	1029	1081
	30 "	755	815	864	906	948	1018	1080	1138
	40 "	795	864	920	968	1017	1096	1168	1234
	50 "	832	909	972	1025	1080	1171	1250	1325
	60 "	865	951	1019	1078	1137	1238	1326	1403
10	10 ft.	767	802	830	854	879	920	955	986
	15 "	802	843	879	909	938	987	1032	1071
	20 "	830	879	920	953	987	1044	1095	1138
	25 "	855	910	955	993	1032	1095	1152	1204
	30 "	879	955	987	1029	1071	1141	1203	1261
	40 "	918	987	1043	1091	1140	1219	1291	1357
	50 "	955	1032	1095	1148	1203	1294	1373	1448
	60 "	988	1074	1142	1201	1260	1361	1449	1526
12	10 ft.	890	925	953	977	1002	1043	1078	1109
	15 "	925	966	1002	1032	1061	1110	1155	1194
	20 "	953	1002	1043	1076	1110	1167	1218	1261
	25 "	978	1033	1078	1116	1155	1218	1275	1327
	30 "	1002	1078	1110	1152	1194	1264	1326	1384
	40 "	1041	1110	1166	1214	1263	1343	1414	1480
	50 "	1078	1155	1218	1271	1326	1417	1496	1571
	60 "	1111	1197	1265	1324	1383	1484	1572	1649

18" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 1.77 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	503	547	583	613	645	696	740	779
	15 "	547	599	645	682	719	781	838	887
	20 "	583	645	696	739	781	854	917	972
	25 "	615	684	740	788	838	917	990	1055
	30 "	645	719	781	834	887	976	1054	1128
	40 "	694	781	852	912	974	1075	1165	1248
	50 "	740	838	917	985	1054	1169	1270	1363
	60 "	783	891	978	1052	1126	1254	1365	1462
5	10 ft.	580	624	660	690	722	773	817	856
	15 "	624	676	722	759	796	858	915	964
	20 "	660	722	773	816	858	931	994	1049
	25 "	692	761	817	865	915	994	1067	1132
	30 "	722	796	858	911	964	1053	1131	1205
	40 "	771	858	929	989	1051	1152	1242	1325
	50 "	817	915	994	1062	1131	1246	1347	1440
	60 "	860	968	1055	1129	1203	1331	1442	1539
6	10 ft.	658	702	738	768	800	851	895	934
	15 "	702	754	800	837	874	936	993	1042
	20 "	738	800	851	894	936	1009	1072	1127
	25 "	770	839	895	943	993	1072	1145	1210
	30 "	800	874	936	989	1042	1131	1209	1283
	40 "	849	936	1007	1067	1129	1230	1320	1403
	50 "	895	993	1072	1140	1209	1324	1425	1518
	60 "	938	1046	1133	1207	1281	1409	1520	1617
8	10 ft.	814	858	894	924	956	1007	1051	1090
	15 "	858	910	956	993	1030	1092	1149	1198
	20 "	894	956	1007	1050	1092	1165	1228	1283
	25 "	926	995	1051	1099	1149	1228	1301	1366
	30 "	956	1030	1092	1145	1198	1287	1365	1439
	40 "	1005	1092	1163	1223	1285	1386	1476	1559
	50 "	1051	1149	1228	1296	1365	1480	1581	1674
	60 "	1094	1202	1289	1363	1437	1565	1676	1773
10	10 ft.	970	1014	1050	1080	1112	1163	1207	1246
	15 "	1014	1066	1112	1149	1186	1248	1305	1354
	20 "	1050	1112	1163	1206	1248	1321	1384	1439
	25 "	1082	1151	1207	1255	1305	1384	1457	1522
	30 "	1112	1186	1248	1301	1354	1443	1521	1595
	40 "	1161	1248	1319	1379	1441	1542	1632	1715
	50 "	1207	1305	1384	1452	1521	1636	1737	1830
	60 "	1250	1358	1445	1519	1593	1721	1832	1929
12	10 ft.	1126	1170	1206	1236	1268	1319	1363	1402
	15 "	1170	1222	1268	1305	1342	1404	1461	1510
	20 "	1206	1268	1319	1362	1404	1477	1540	1595
	25 "	1238	1307	1363	1411	1461	1540	1613	1678
	30 "	1268	1342	1404	1457	1510	1599	1677	1751
	40 "	1317	1404	1475	1535	1597	1698	1788	1871
	50 "	1363	1461	1540	1608	1677	1792	1893	1986
	60 "	1406	1514	1601	1675	1749	1877	1988	2085

20" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 2.18 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	619	674	718	755	794	857	912	960
	15 "	674	737	794	840	885	962	1031	1092
	20 "	718	794	857	909	962	1055	1130	1197
	25 "	757	842	912	970	1031	1130	1219	1300
	30 "	794	885	962	1027	1092	1201	1291	1389
	40 "	855	962	1049	1123	1199	1324	1435	1537
	50 "	912	1031	1130	1212	1297	1439	1563	1679
	60 "	964	1097	1204	1295	1387	1544	1681	1801
5	10 ft.	715	770	814	851	890	953	1008	1056
	15 "	780	833	890	936	981	1058	1127	1188
	20 "	814	890	953	1005	1058	1147	1226	1293
	25 "	853	938	1008	1066	1127	1226	1315	1396
	30 "	890	981	1058	1123	1188	1307	1393	1485
	40 "	951	1058	1145	1219	1295	1420	1531	1633
	50 "	1008	1127	1226	1308	1393	1535	1659	1775
	60 "	1060	1193	1300	1391	1483	1640	1777	1897
6	10 ft.	811	866	910	947	986	1049	1104	1152
	15 "	866	929	986	1032	1077	1154	1223	1284
	20 "	910	986	1049	1101	1154	1243	1322	1389
	25 "	949	1034	1104	1162	1223	1322	1411	1492
	30 "	986	1077	1154	1219	1284	1393	1489	1581
	40 "	1047	1154	1241	1315	1391	1516	1627	1729
	50 "	1104	1223	1322	1404	1489	1631	1755	1871
	60 "	1156	1289	1396	1487	1579	1736	1873	1993
8	10 ft.	1002	1057	1101	1138	1177	1240	1295	1343
	15 "	1057	1120	1177	1223	1268	1345	1414	1475
	20 "	1101	1177	1240	1292	1345	1434	1513	1580
	25 "	1140	1225	1295	1353	1414	1513	1602	1683
	30 "	1177	1268	1345	1410	1475	1584	1680	1772
	40 "	1238	1345	1432	1506	1582	1707	1818	1920
	50 "	1295	1414	1513	1595	1680	1822	1946	2062
	60 "	1347	1480	1587	1678	1770	1927	2064	2184
10	10 ft.	1194	1249	1293	1330	1369	1432	1487	1535
	15 "	1249	1312	1369	1415	1460	1537	1606	1667
	20 "	1293	1369	1432	1484	1537	1626	1705	1772
	25 "	1332	1417	1487	1545	1606	1705	1794	1875
	30 "	1369	1460	1537	1602	1667	1776	1872	1964
	40 "	1430	1537	1624	1698	1774	1899	2010	2112
	50 "	1487	1606	1705	1787	1872	2014	2138	2254
	60 "	1539	1672	1779	1870	1962	2119	2256	2376
12	10 ft.	1386	1441	1485	1522	1561	1624	1679	1727
	15 "	1441	1504	1561	1607	1652	1729	1798	1859
	20 "	1485	1561	1624	1676	1729	1818	1897	1964
	25 "	1524	1609	1679	1737	1798	1897	1986	2067
	30 "	1561	1652	1729	1794	1859	1958	2064	2156
	40 "	1622	1729	1816	1890	1966	2081	2202	2304
	50 "	1679	1798	1897	1979	2064	2206	2330	2446
	60 "	1731	1864	1971	2062	2154	2311	2448	2568

24" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 3.14 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors							
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
4	10 ft.	892	971	1033	1087	1143	1234	1313	1382
	15 "	971	1062	1143	1209	1275	1385	1486	1573
	20 "	1033	1143	1234	1310	1385	1514	1627	1724
	25 "	1090	1212	1313	1398	1486	1627	1756	1872
	30 "	1143	1275	1385	1479	1573	1730	1869	2001
	40 "	1231	1385	1511	1617	1727	1906	2066	2214
	50 "	1313	1486	1627	1746	1869	2073	2252	2418
	60 "	1388	1580	1734	1866	1997	2223	2421	2594
5	10 ft.	1030	1109	1171	1225	1281	1372	1451	1520
	15 "	1109	1200	1281	1347	1413	1523	1624	1711
	20 "	1171	1281	1372	1448	1523	1652	1765	1862
	25 "	1228	1350	1451	1536	1624	1765	1894	2010
	30 "	1281	1413	1523	1617	1711	1868	2007	2139
	40 "	1369	1523	1649	1755	1865	2044	2204	2352
	50 "	1451	1624	1765	1884	2007	2211	2390	2556
	60 "	1526	1718	1872	2004	2135	2361	2559	2732
6	10 ft.	1168	1247	1309	1363	1419	1510	1589	1658
	15 "	1247	1338	1419	1485	1551	1661	1762	1849
	20 "	1309	1419	1510	1586	1661	1790	1903	2000
	25 "	1366	1468	1589	1674	1762	1903	2032	2148
	30 "	1419	1551	1661	1755	1849	2006	2145	2277
	40 "	1507	1661	1787	1893	2003	2182	2342	2490
	50 "	1589	1762	1903	2022	2145	2349	2528	2694
	60 "	1664	1856	2012	2142	2273	2499	2697	2870
8	10 ft.	1444	1523	1585	1639	1695	1786	1865	1934
	15 "	1523	1614	1695	1761	1827	1937	2038	2125
	20 "	1585	1695	1786	1862	1937	2066	2179	2276
	25 "	1642	1764	1865	1950	2038	2179	2308	2424
	30 "	1695	1827	1937	2031	2125	2282	2421	2553
	40 "	1783	1937	2063	2169	2279	2458	2618	2766
	50 "	1865	2038	2179	2298	2421	2625	2804	2970
	60 "	1940	2132	2286	2418	2549	2775	2973	3146
10	10 ft.	1721	1800	1862	1916	1972	2063	2142	2211
	15 "	1800	1891	1972	2038	2104	2214	2315	2402
	20 "	1862	1972	2063	2139	2214	2343	2456	2553
	25 "	1919	2041	2142	2227	2315	2456	2585	2701
	30 "	1972	2104	2214	2308	2402	2559	2698	2830
	40 "	2060	2214	2340	2446	2556	2735	2895	3043
	50 "	2142	2315	2456	2575	2698	2902	3081	3241
	60 "	2217	2409	2563	2695	2826	3052	3250	3423
12	10 ft.	1997	2076	2138	2192	2248	2339	2418	2487
	15 "	2076	2167	2248	2314	2380	2490	2591	2678
	20 "	2138	2248	2339	2415	2490	2619	2732	2829
	25 "	2195	2317	2418	2503	2591	2732	2861	2977
	30 "	2248	2380	2490	2584	2678	2835	2974	3106
	40 "	2336	2490	2616	2722	2832	3011	3171	3319
	50 "	2418	2591	2732	2851	2974	3178	3357	3523
	60 "	2593	2685	2839	2971	3102	3328	3526	3699

30" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 4.91 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors						
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
	10 ft.	1397	1520	1119	1702	1791	1934	2057	2165
	15 "	1520	1663	1791	1894	1998	2170	2327	2465
	20 "	1619	1791	1934	2052	2170	2372	2549	2701
4	25 "	1707	1899	2057	2189	2327	2549	2750	2932
	30 "	1791	1998	2170	2317	2465	2711	2927	3134
	40 "	1921	2170	2367	2534	2706	2987	3237	3469
	50 "	2057	2327	2549	2736	2927	3247	3528	3788
	60 "	2175	2475	2716	2923	3129	3483	3793	4064
	10 ft.	1613	1736	1835	1918	2001	2150	2273	2381
	15 "	1736	1879	2007	2110	2214	2386	2543	2681
	20 "	1835	2007	2150	2268	2386	2588	2765	2917
5	25 "	1923	2115	2273	2405	2543	2765	2966	3148
	30 "	2007	2214	2386	2533	2681	2927	3143	3350
	40 "	2145	2386	2583	2750	2922	3203	3453	3685
	50 "	2273	2543	2765	2952	3143	3463	3744	4004
	60 "	2391	2691	2932	3139	3345	3699	4009	4280
	10 ft.	1830	1953	2052	2135	2224	2367	2490	2598
	15 "	1953	2096	2224	2327	2431	2603	2760	2898
	20 "	2052	2224	2367	2485	2603	2805	2982	3134
6	25 "	2140	2332	2490	2622	2760	2982	3181	3365
	30 "	2224	2431	2603	2750	2898	3144	3360	3567
	40 "	2362	2603	2800	2967	3139	3420	3670	3902
	50 "	2490	2760	2982	3169	3360	3680	3961	4221
	60 "	2608	2908	3149	3356	3562	3916	4226	4497
	10 ft.	2263	2386	2485	2568	2651	2800	2923	3031
	15 "	2386	2529	2657	2760	2864	3036	3193	3331
	20 "	2485	2659	2800	2918	3036	3238	3415	3567
8	25 "	2573	2765	2923	3055	3193	3415	3616	3798
	30 "	2657	2864	3036	3183	3331	3577	3793	4000
	40 "	2795	3036	3233	3400	3572	3853	4103	4335
	50 "	2923	3193	3415	3602	3793	4113	4394	4654
	60 "	3041	3341	3582	3789	3995	4349	4659	4930
	10 ft.	2696	2819	2918	3001	3090	3233	3356	3464
	15 "	2819	2962	3090	3193	3297	3469	3626	3764
	20 "	2918	3090	3233	3351	3469	3671	3848	400
	25 "	3006	3198	3356	3488	3626	3848	4049	4231
10	30 "	3090	3297	3469	3616	3764	4010	4226	4433
	40 "	3228	3469	3766	3833	4005	4286	4536	4768
	50 "	3356	3626	3848	4035	4226	4546	4821	5087
	60 "	3474	3774	4015	4222	4428	4782	5092	5363
	10 ft.	3129	3252	3351	3434	3523	3666	3789	3897
	15 "	3252	3395	3523	3626	3730	3902	4059	4197
	20 "	3351	3523	3666	3784	3902	4104	4281	4433
12	25 "	3439	3631	3789	3921	4059	4281	4482	4664
	30 "	3523	3730	3902	4049	4197	4443	4659	4866
	40 "	3661	3902	4099	4266	4438	4719	4969	5201
	50 "	3789	4059	4281	4468	4659	4879	5260	5520
	60 "	3907	4207	4448	4655	4861	5215	5525	5796

36" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 7.07 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors						
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
	10 ft.	2011	2188	2329	2450	2577	2782	2959	3115
	15 "	2188	2393	2577	2726	2874	3122	3349	3547
	20 "	2329	2577	2782	2952	3122	3412	3667	3887
4	25 "	2457	2733	2959	3151	3349	3667	3958	4220
	30 "	2577	2874	3122	3335	3547	3901	4213	4510
	40 "	2775	3122	3405	3646	3894	4297	4659	4991
	50 "	2959	3349	3667	3936	4213	4673	5076	5452
	60 "	3129	3561	3908	4205	4503	5013	5459	5848
	10 ft.	2323	2500	2641	2762	2889	3094	3271	3427
	15 "	2500	2705	2889	3038	3186	3434	3661	3859
	20 "	2641	2889	3094	3264	3434	3724	3979	4199
5	25 "	2769	3045	3271	3463	3661	3979	4270	4532
	30 "	2889	3186	3434	3647	3859	4213	4525	4822
	40 "	3087	3434	3717	3958	4206	4609	4971	5303
	50 "	3271	3661	3979	4248	4525	4985	5388	5764
	60 "	3441	3873	4220	4517	4815	5325	5771	6160
	10 ft.	2634	2811	2952	3073	3200	3405	3582	3738
	15 "	2811	3016	3200	3349	3497	3745	3972	4170
	20 "	2952	3200	3405	3575	3745	4035	4290	4510
6	25 "	3080	3355	3582	3774	3972	4290	4581	4843
	30 "	3200	3497	3745	3958	4170	4524	4836	5133
	40 "	3398	3745	4028	4269	4517	4920	5282	5614
	50 "	3582	3972	4290	4559	4836	5296	5699	6075
	60 "	3752	4184	4531	4828	5126	5636	6082	6471
	10 ft.	3257	3434	3575	3696	3823	4028	4205	4361
	15 "	3434	3639	3823	3972	4120	4368	4595	4793
	20 "	3575	3823	4028	4198	4368	4658	4913	5133
8	25 "	3703	3979	4205	4397	4595	4913	5204	5466
	30 "	3823	4120	4368	4581	4793	5147	4459	5756
	40 "	4021	4368	4651	4892	5140	5543	5905	6240
	50 "	4208	4595	4913	5182	5459	5919	6322	6698
	60 "	4375	4807	5154	5451	5749	6259	6705	7094
	10 ft.	3880	4057	4198	4319	4446	4651	4828	4984
	15 "	4057	4262	4446	4595	4743	4991	5218	5416
	20 "	4198	4446	4651	4821	4991	5281	5536	5755
	25 "	4326	4602	4828	5020	5218	5536	5827	6089
10	30 "	4446	4743	4991	5204	5416	5770	6082	6379
	40 "	4644	4991	5274	5515	5763	6166	6528	6860
	50 "	4828	5218	5536	5805	6082	6542	6945	7321
	60 "	4998	5430	5777	6074	6372	6882	7328	7717
	10 ft.	4503	4680	4821	4942	5069	5274	5451	5607
	15 "	4680	4885	5069	5118	5366	5614	5841	6039
	20 "	4821	5069	5274	5444	5614	5904	6159	6379
	25 "	4949	5225	5451	5643	5841	6159	6450	6712
12	30 "	5069	5366	5614	5827	6039	6393	6705	7002
	40 "	5267	5614	5897	6138	6386	6789	7151	7483
	50 "	5451	5841	6159	6428	6705	7165	7568	7944
	60 "	5621	6053	6400	6697	6989	7505	7951	8340

42" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 9.6 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors						
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
	10 ft.	2738	2979	3172	3336	3509	3789	4030	4242
	15 "	2979	3259	3509	3712	2914	4252	4560	4830
	20 "	3172	3509	3789	4020	4252	4647	4994	5293
4	25 "	3345	3721	4030	4290	4560	4994	5389	5746
	30 "	3509	3914	4252	3541	4830	5312	5736	6141
	40 "	3779	4252	4637	4965	5302	5852	6343	6797
	50 "	4030	4560	4994	5360	5736	6363	6912	7423
	60 "	4261	4849	5322	5727	6131	6825	7433	7963
	10 ft.	3162	3403	3596	3760	3933	4213	4454	4666
	15 "	3403	3683	3933	4136	4338	4676	5071	5254
	20 "	3596	3933	4213	4444	4676	5071	5418	5717
	25 "	3769	4145	4454	4714	4984	5418	5813	6170
5	30 "	3933	4338	4676	4965	5254	5736	6160	6565
	40 "	4203	4676	5061	5389	5726	6276	6767	7221
	50 "	4454	4984	5418	5784	6160	6787	7336	7847
	60 "	4685	5273	5746	6151	6555	7249	7857	8387
	10 ft.	3586	3827	4020	4184	4357	4637	4878	5090
	15 "	3827	4107	4357	4550	4762	5100	5408	5678
	20 "	4020	4357	4637	4868	5100	5495	5842	6141
	25 "	4193	4569	4878	5138	5408	5842	6237	6594
6	30 "	4357	4762	5100	5389	5678	6160	6584	6989
	40 "	4627	5100	5485	5813	6150	6700	7191	7645
	50 "	4878	5408	5842	6208	6584	7211	7760	8271
	60 "	5109	5697	6170	6575	6979	7673	8281	8811
	10 ft.	4434	4675	4868	5032	5205	5485	5726	5938
	15 "	4675	4955	5205	5408	5610	5948	6256	6526
	20 "	4868	5205	5485	5718	5948	6343	6690	6989
	25 "	5041	5417	5726	5986	6256	6690	7085	7442
8	30 "	5205	5610	5948	6237	6526	7008	7432	7837
	40 "	5475	5948	6333	6661	6998	7548	8039	8493
	50 "	5726	6256	6690	7056	7432	8059	8608	9119
	60 "	5957	6545	7018	7423	7827	8521	9129	9659
	10 ft.	5283	5524	5717	5881	6054	6334	6575	6787
	15 "	5524	5804	6054	6257	6459	6797	7105	7375
	20 "	5717	6054	6334	6565	6797	7192	7539	7838
	25 "	5890	6266	6575	6835	7105	7539	7934	8291
10	30 "	6054	6459	6797	7086	7375	7857	8281	8686
	40 "	6324	6797	7182	7510	7847	8397	8888	9342
	50 "	6575	7105	7539	7905	8281	8908	9457	9968
	60 "	6808	7394	7867	8272	8676	9370	9978	10508
	10 ft.	6131	6372	6565	6729	6902	7182	7423	7635
	15 "	6372	6652	6902	7105	7307	7645	7953	8223
	20 "	6565	6902	7182	7413	7645	8040	8387	8686
12	25 "	6738	7114	7423	7683	7953	8387	8782	9139
	30 "	6902	7307	7645	7934	8223	8705	9129	9534
	40 "	7172	7645	8030	8358	8695	9245	9736	10190
	50 "	7423	7953	8387	8753	9129	9756	10305	10816
	60 "	7654	8242	8715	9170	9524	10218	10826	11356

48" Breidert Air-X-Hauster

Capacity — Cubic Feet Per Minute • Neck Area — 12.6 Sq. Feet

Wind Vel. MPH	Height Above Intake	Temperature Difference Between In and Out Doors						
		10 deg. Cap.CFM	15 deg. Cap.CFM	20 deg. Cap.CFM	25 deg. Cap.CFM	30 deg. Cap.CFM	40 deg. Cap.CFM	50 deg. Cap.CFM	60 deg. Cap.CFM
	10 ft.	3564	3878	4129	4343	4568	4932	5246	5522
	15 "	3878	4242	4568	4837	5096	5535	5936	6288
	20 "	4129	4568	4932	5234	5535	6049	6501	6890
4	25 "	4355	4845	5246	5585	5936	6501	7016	7480
	30 "	4568	5095	5535	5911	6288	6915	7467	7995
	40 "	4920	5535	6037	6463	6903	9618	8258	8848
	50 "	5246	5936	6501	6978	7467	8283	8999	9664
	60 "	5547	6313	6928	7455	7982	8886	9676	10367
	10 ft.	4116	4430	4681	4895	5120	5484	5798	6074
	15 "	4430	4794	5120	5384	5648	6087	6488	6840
	20 "	4681	5120	5484	5786	6087	6601	7053	7442
	25 "	4907	5397	5798	6137	6488	7053	7568	8032
5	30 "	5120	5647	6087	6463	6840	7467	8019	8547
	40 "	5472	6087	6589	7015	7455	8170	8810	9400
	50 "	5798	6488	7053	7530	8019	8835	9551	10216
	60 "	6099	6865	7480	8007	8534	9438	10228	10919
	10 ft.	4668	4982	5233	5447	5672	6036	6350	6626
	15 "	4982	5346	5672	5936	6200	6639	7040	7392
	20 "	5233	5672	6036	6338	6639	7153	7605	7994
	25 "	5459	5949	6350	6689	7040	7605	8120	8584
6	30 "	5672	6199	6639	7015	7392	8019	8571	9099
	40 "	6024	6639	7141	7567	8007	8722	9362	9952
	50 "	6350	7040	7605	8082	8571	9387	10103	10768
	60 "	6651	7417	8032	8559	9086	9990	10780	11471
	10 ft.	5773	6087	6338	6552	6777	7141	7455	7731
	15 "	6087	6451	6777	7041	7305	7744	8145	8497
	20 "	6338	6777	7141	7443	7744	8258	8710	9099
	25 "	6564	7054	7455	7794	8145	8710	9225	9689
8	30 "	6777	7304	7744	8120	8497	9124	9676	10204
	40 "	7129	7744	8246	8672	9112	9827	10467	11057
	50 "	7455	8145	8710	9187	9676	10492	11208	11873
	60 "	7756	8522	9137	9664	10191	11195	11885	12576
	10 ft..	6877	7191	7442	7656	7881	8245	8559	8835
	15 "	7191	7555	7881	8145	8409	8848	9249	9601
	20 "	7442	7881	8245	8547	8848	9362	9814	10203
	25 "	7668	8158	8559	8898	9249	9814	10329	10793
10	30 "	7881	8408	8848	9224	9601	10228	10780	11308
	40 "	8233	8848	9350	9776	10216	10931	11571	12161
	50 "	8559	9249	9814	10291	10780	11596	12312	12977
	60 "	8860	9626	10241	10768	11295	12199	12989	13680
	10 ft.	7981	8295	8546	8760	8985	9349	9663	9939
	15 "	8295	8659	8985	9249	9513	9952	10353	10705
	20 "	8546	8985	9349	9651	9952	10466	10918	11307
12	25 "	8772	9262	9663	10002	10353	10918	11433	11897
	30 "	8985	9512	9952	10326	10705	11332	11884	12412
	40 "	9337	9952	10454	10880	11320	12035	12675	13265
	50 "	9663	10353	10918	11395	11884	12700	13416	14081
	60 "	9964	10730	11345	11872	12399	13303	14093	14784

WIND VELOCITIES THROUGHOUT THE UNITED STATES. Here are listed the lowest monthly average wind velocity (LMV), highest monthly average wind velocity (HMV), average yearly wind velocity (AYV), yearly prevailing wind direction (YPD), and the highest recorded wind velocity (HRV), according to U. S. Weather Bureau records.

For most satisfactory results, ventilator capacities should be figured on the basis of lowest monthly average, since in most cases the lowest wind velocities are during the summer when the need is greatest. Proper allowances may be made according to conditions. By referring to pages 18, 19 and 20 the capacities of various size ventilators can be determined according to the wind velocities in each territory.

STATE	CITY	LMV MPH	HMV MPH	AYV MPH	YPD	HRV
ALABAMA	BIRMINGHAM	4.9 AUG	8.6 MAR	6.7	SOUTH	46
	MOBILE	8. "	11. "	9.7	NORTH	87
	MONTGOMERY	5.8 "	8. FEB	6.8	EAST	41
ARIZONA	PHOENIX	5.1 DEC	6.4 APR	5.8	WEST	40
	YUMA	4.7 OCT	6.5 MAR	5.9	NORTH	43
ARKANSAS	FORT SMITH	5.5 AUG	9.2 MAR	7.2	EAST	57
	LITTLE ROCK	5.7 "	9.4 "	7.4	SOUTH	49
CALIFORNIA	EUREKA	6.1 OCT	8.8 APR	7.4	NORTH	46
	FRESNO	5.3 NOV	8.7 JUNE	6.9	N.W.	41
	LOS ANGELES	5.7 SEP	6.4 FEB	6.1	S.W.	38
	OAKLAND	7.3 NOV	11.8 JULY	9.3	WEST	50
	RED BLUFF	4.5 AUG	6.7 MAR	5.8	S.E.	49
	SACRAMENTO	6.1 NOV	8.6 JUNE	7.5	SOUTH	65
	SAN DIEGO	6.1 "	7.3 APR	6.7	N.W.	43
	SAN FRANCISCO	7.3 "	11.8 JULY	9.3	WEST	50
	SAN JOSE	5.9 OCT	7.4 MAY	6.7	N.W.	38
COLORADO	DENVER	6.6 AUG	8.4 APR	7.4	SOUTH	53
	GRAND JUNCTION	3.8 JAN	6.8 "	5.5	S.E.	--
	PUEBLO	6. AUG	8.2 "	6.8	N.W.	64
CONNECTICUT	HARTFORD	6.2 SEPT	8.7 "	7.5	N.W.	58
	NEW HAVEN	7.1 AUG	10.1 MAR	8.7	NORTH	49
DIST.OF COL.	WASHINGTON	4.8 AUG	8.5 "	6.4	N.W.	55
FLORIDA	APALACHICOLA	6. JULY	9.3 OCT	7.8	NORTH	59
	JACKSONVILLE	8.3 AUG	9.8 MAR	9.1	N.E.	58
	KEY WEST	8.3 "	11. NOV	9.9	EAST	84
	MIAMI	8.1 JUL	10.7 "	9.3	"	87
	PENSACOLA	9.2 AUG	11. MAR	10.6	N.E.	91
	TAMPA	6.7 "	8.6 "	7.8	N.E.	75
	ATLANTA	8.1 AUG	11.9 FEB	10.2	N.W.	51
	AUGUSTA	5.4 "	7.1 MAR	6.2	N.W.	49
	MACON	5.7 "	7.8 "	6.7	N.W.	46
	SAVANAH	7.4 "	10.3 "	8.8	S.W.	68
	THOMASVILLE	3.8 "	5.9 "	4.8	S.W.	
IDAHO	BOISE	5.4 OCT	7. APR	6.	N.W.	43
	POCATELLO	7.9 AUG	9.8 MAR	8.8	S.E.	46
ILLINOIS	CAIRO	6. AUG	11.1 MAR	8.5	SOUTH	65
	CHICAGO	10. "	13. "	11.	S.W.	65
	PEORIA	5.7 "	9.4 "	7.7	SOUTH	45
	SPRINGFIELD	9.4 "	13.8 "	11.6	"	45
INDIANA	EVANSVILLE	6.4 AUG	10.6 MAR	8.5	SOUTH	60
	FT. WAYNE	7.6 "	11. "	9.6	S.W.	51
	INDIANAPOLIS	8.5 "	12.1 "	10.5	SOUTH	63
	TERRE HAUTE	7.2 "	11.7 "	9.4	SOUTH	47
IOWA	CHARLES CITY	5.2 AUG	8.7 APR	7.1	N.W.	48
	DAVENPORT	7.1 "	10.2 "	8.7	N.W.	56
	DES MOINES	6.1 "	9.5 "	7.8	S.W.	50
	DUBUQUE	5.8 "	8.1 "	7.	N.W.	47
	KEOKUK	5.7 "	9.1 MAR	7.5	S.W.	49
	SIOUX CITY	9.9 "	13.2 APR	11.6	N.W.	65
KANSAS	CONCORDIA	6.5 AUG	9.8 APR	7.8	SOUTH	60
	DODGE CITY	9.9 "	13.2 "	11.	S.E.	58
	WICHITA	11.1 "	14. MAR	12.1	SOUTH	68
KENTUCKY	LEXINGTON	8.5 AUG	14.1 MAR	11.5	S.W.	56
	LOUISVILLE	6.5 "	10.7 "	8.7	S.W.	58
LOUISIANA	NEW ORLEANS	5.8 AUG	8.8 MAR	8.7	S.E.	66
	SHREVEPORT	5.5 "	8.8 "	7.	S.E.	50
MAINE	EASTPORT	7.3 AUG	12.5 JAN	9.9	SOUTH	--
	PORTLAND	7.1 "	9.6 MAR	8.6	N.W.	48
MARYLAND	BALTIMORE	6.9 AUG	8.6 MAR	7.6	N.W.	54
MASS.	BOSTON	12.2 AUG	16.5 FEB	14.3	WEST	60
	NANTUCKET	11.6 "	16.3 MAR	14.6	S.W.	66
MICHIGAN	ALPENA	9.3 JUN	12.7 MAR	11.5	N.W.	47
	DETROIT	9. AUG	14. "	12.	S.W.	67
	ESCANABA	8.2 "	10.1 NOV	9.3	SOUTH	45
	GRAND HAVEN	8.3 AUG	13.4 "	11.3	WEST	60
	GRAND RAPID	7.4 "	9.6 "	9.6	WEST	51
	HOUGHTON	7.7 "	9.4 "	8.7	"	63
	LANSING	4. "	7.8 MAY	6.	S.W.	45
	LUDINGTON	8.9 JUL	12.6 NOV	10.7	SOUTH	46
	MARQUETTE	8.4 JUN	11.4 JAN	10.2	N.W.	53
	SAULT ST.MARIE	6.8 AUG	9.8 MAR	8.5	N.W.	56
MINNESOTA	DULUTH	9.8 JUL	12.9 APR	12.	N.E.	60
	MINNEAPOLIS	10. "	12.3 "	11.2	N.W.	65
	MOORHEAD	8.3 "	10.9 "	9.7	N.W.	58
	ST. PAUL	7.9 AUG	10.7 "	9.4	S.E.	78
MISSISSIPPI	JACKSON	4.9 AUG	8.1 MAR	6.4	S.E.	49
	MERIDIAN	4.1 "	6.9 "	5.4	S.W.	40
	VICKSBURG	4.9 "	8.1 "	6.4	S.E.	49

STATE	CITY	LMV MPH		HMV MPH		AYV MPH	YPD	HRV
MISSOURI	COLUMBIA	5.7	AUG	10.2	MAR	8.	SOUTH	50
	HANNIBAL	7.5	"	10.8	"	9.2	S.W.	47
	KANSAS CITY	9.	"	14.	"	11.	SOUTH	57
	ST. JOSEPH	7.2	"	10.5	"	8.8	S.E.	51
	ST. LOUIS	8.9	"	12.4	"	10.8	SOUTH	91
	SPRINGFIELD	8.3	"	11.9	"	10.2	S.E.	52
MONTANA	HAVRE	7.	AUG	10.	DEC	8.6	S.W.	57
	HELENA	7.2	DEC	8.7	APR	7.9	S.W.	54
	KALISPELL	5.2	NOV	6.9	"	6.	N.W.	38
	MILES CITY	5.3	JAN	7.5	"	5.6	SOUTH	47
NEBRASKA	LINCOLN	9.	AUG	12.1	APR	10.4	SOUTH	62
	NORTH PLATTE	8.3	"	10.7	"	8.7	WEST	73
	OMAHA	7.5	"	10.3	MAR	9.	N.W.	53
	VALENTINE	9.3	JAN	12.8	APR	10.5	N.W.	59
NEVADA	RENO	5.8	DEC	8.5	APR	7.	WEST	46
	WINNEMUCCA	6.8	AUG	8.8	"	7.8	S.W.	75
NEW HAMP.	CONCORD	5.2	AUG	7.6	APR	6.4	N.W.	40
N.JERSEY	ATLANTIC CITY	13.	AUG	16.8	MAR	14.9	N.W.	--
	CAMDEN	9.2	"	11.9	"	10.4	N.W.	68
	NEWARK'	12.4	"	17.8	"	15.2	N.W.	--
	SANDY HOOK	11.	JUL	16.	"	14.	N.W.	--
	TRENTON	8.9	AUG	12.4	"	10.6	N.W.	--
N.MEXICO	ALBUQUERQUE	6.9	JAN	9.6	APR	7.8	WEST'	63
	ROSWELL	5.7	AUG	9.3	MAR	6.9	SOUTH	64
	SANTA FE	6.		8.4	APR	7.1	S.E.	42
NEW YORK	ALBANY	6.8	AUG	9.2	MAR	8.	SOUTH	59
	BINGHAMPTON	4.4	"	7.3	"	5.9	N.W.	37
	BUFFALO	11.7	"	17.7	JAN	14.6	S.W.	73
	CANTON	8.2	"	11.4	"	10.1	S.W.	62
	ITHACA	7.6	"	12.	"	9.9	N.W.	70
	NEW YORK	12.4	"	17.9	MAR	15.2	N.W.	73
	OSWEGO	8.	"	12.	JAN	10	SOUTH	49
	ROCHESTER	7.5	"	10.8	FEB	9.2	S.W.	60
	SYRACUSE	8.7	"	13.2	"	11.2	SOUTH	--
N.CAROLINA	ASHEVILLE	5.4	JUL	10.2	MAR	7.8	N.W.	40
	CHARLOTTE	4.5	AUG	7.5	"	5.8	S.W.	45
	GREENSBORO	6.2	"	9.6	"	7.6	S.W.	49
	HATTERAS	10.8	"	15.4	"	12.8	S.W.	80
	RALEIGH	5.6	"	8.6	"	7.	S.W.	45
	WILMINGTON	6.4	DEC.	9.3	"	7.7	S.W.	53
N. DAKOTA	BISMARCK	8.3	DEC.	10.9	APR	9.1	N.W.	63
	DEVILS LAKE	9.2	AUG	12.	"	10.6	N.W.	--
	FARGO	8.3	JUL	10.9	"	9.7	N.W.	58
	WILLISTON	8.3	AUG	10.5	MAY	8.9	WEST'	56
OHIO	CINCINNATI	5.3	AUG	8.8	MAR	7.1	S.W.	54
	CLEVELAND	10.9	JUL	15.	JAN	13.2	SOUTH	60
	COLUMBUS	8.2	AUG	12.4	MAR	10.4	S.W.	60
	DAYTON	7.	"	12.	"	9.6	S.W.	51
	SANDUSKY	9.7	JUL	13.6	"	11.9	S.W.	56
	TOLEDO	9.4	AUG	12.5	"	11.2	S.W.	65
OKLAHOMA	OKLAHOMA CITY	9.2	AUG	13.9	MAR	11.5	SOUTH	57
OREGON	BAKER	6.6	AUG	7.5	APR	6.9	S.E.	40
	PORTLAND	6.1	OCT	7.5	FEB	7.	N.W.	43
	ROSEBURG	2.4	"	3.8	APR	3.3	N.W.	40

STATE	CITY	LMV MPH		HMV MPH		AYV MPH	YPD	HRV
PENNSYLVANIA	ERIE	9.3	AUG	13.2	JAN	11.4	WEST	55
	HARRISBURG	5.1	"	8.6	MAR	6.8	WEST	54
	PHILADELPHIA	9.2	"	11.9	"	10.4	N.W.	68
	PITTSBURG	8.6	"	12.	"	10.4	N.W.	56
	READING	5.5	"	8.8	"	6.9	N.W.	70
	SCRANTON	5.5	"	8.2	"	6.9	S.W.	41
RHODE ISLAND	BLOCK ISLAND	11.9	AUG	18.1	DEC	14.7	S.W.	69
	PROVIDENCE	9.3	"	13.4	MAR	11.6	N.W.	63
S. CAROLINA	CHARLESTON	9.2	AUG	11.6	MAR	10.5	S.W.	81
	COLUMBIA	5.7	"	10.2	"	8.	SOUTH	50
	GREENVILLE	6.6	"	9.6	"	8.	N.E.	50
S. DAKOTA	HURON	9.	AUG	12.8	APR	10.8	S.E.	56
	RAPID CITY	6.8	"	10.4	"	7.8	WEST	--
	YANKTON	6.2	"	10.4	"	8.2	N.W.	80
TENNESSEE	CHATTANOOGA	5.2	AUG	8.4	MAR	6.6	S.W.	64
	KNOXVILLE	5.6	"	7.9	"	6.6	S.W.	59
	MEMPHIS	7.1	"	10.2	"	8.6	S.W.	58
	NASHVILLE	7.2	"	11.9	APR	9.1	N.W.	58
TEXAS	ABILENE	8.2	AUG	11.9	APR	9.9	SOUTH	51
	AMARILLO	10.5	"	14.	"	12.2	"	65
	AUSTIN	6.6	SEP	9.4	MAR	7.7	S.E.	44
	BROWNSVILLE	7.5	"	11.1	"	9.2	S.E.	80
	CORPUS CRISTI	10.4	DEC	14.1	APR	11.9	S.E.	72
	DALLAS	8.4	AUG	12.3	"	10.1	S.E.	63
	DEL RIO	7.3	DEC	10.1	"	8.9	S.E.	57
	EL PASO	8.	SEP	11.6	MAR	9.3	EAST	60
	FT. WORTH	9.2	AUG	11.6	"	10.2	SOUTH	55
	GALVESTON	9.1	"	11.7	APR	10.6	S.E.	71
	HOUSTON	8.2	"	11.3	MAR	9.8	S.E.	63
	PALESTINE	5.7	"	9.2	"	7.2	SOUTH	47
	PORT ARTHUR	8.	"	10.9	APR	9.5	"	42
	SAN ANTONIO	6.9	"	9.1	MAR	7.9	S.E.	56
UTAH	SALT LAKE CITY	6.4	DEC	8.7	APR	7.7	S.E.	53
VERMONT	BURLINGTON	8.4	JUL	12.8	JAN	10.3	SOUTH	54
VIRGINIA	CAPE HENRY	10.1	JUL	13.7	MAR	12.3	S.W	80
	LYNCHBERG	6.1	AUG	9.2	"	7.5	N.W.	49
	NORFOLK	10.5	"	14.2	"	12.2	SOUTH	63
	RICHMOND	6.1	"	9.1	"	7.3	S.W.	48
WASHINGTON	NORTH HEAD	11.5	AUG	18.6	DEC	14.8	N.W.	126
	SEATTLE	7.	"	11.9	JAN	9.1	SOUTH	59
	SPOKANE	5.9	OCT	7.4	APR	6.5	S.W.	41
	TACOMA	5.4	AUG	7.2	MAR	6.3	S.W.	44
	TATOOSH ISLAND	9.9	JUL	21.4	DEC	15.	EAST	110
	WALLA WALLA	4.6	OCT	6.4	MAR	5.5	SOUTH	53
	YAKIMA	4.4	NOV	7.6	MAY	5.9	N.W.	34
W. VIRGINIA	ELKINS	2.6	AUG	5.1	MAR	4.5	WEST	44
	PARKERSBURG	5.1	"	8.2	"	6.5	S.E.	--
WISCONSIN	GREEN BAY	8.7	AUG	11.2	APR	10.1	SOUTH	53
	LA CROSSE	6.	"	8.6	"	7.3	"	69
	MADISON	7.6	JUL	11.2	MAR	9.7	N.W.	56
	MILWAUKEE	8.7	"	12.2	"	10.9	WEST	49
WYOMING	CHEYENNE	8.4	AUG	13.8	JAN	11.2	N.W.'	63
	LAUDER	3.4	DEC	5.5	APR	4.5	S.W.	74
	SHERIDAN	4.5	AUG	7.3	APR	5.4	N.W.	58
	YELLOWSTON PK.	6.8	AUG	8.7	MAR	7.8	SOUTH	--

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